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ABSTRACT

This curriculum guide was designed for use in postsecondary radiological technology education programs in Georgia. Its purpose is to provide for the development of entry level skills in radiological technology in the areas of knowledge, theoretical structure, tool usage, diagnostic ability, related supportive skills, and occupational survival skills. The first two sections of 10 explain the philosophy and objectives of state and local vocational education, and of the guide. In section 3, the occupational field of radiological technology is described; and employability skills, student exit points, and task cross referenced to the Dictionary of Occupational Titles are listed. The curriculum structure and course outline are provided in section 4, while section 5, the main part of the guide, provides unit guides for each task to be taught. (For each task, a task description, student performance objective, suggested instructional activities, instructional materials, evaluation sections, suggested classroom hours, and related instruction tasks are included.) Section 6 contains references and resources, while student record forms comprise section 7. Following suggestions for working with special needs students (section 8), the guide concludes with a facility layout for a learning resource center and a laboratory, and definitions of terms (sections 9 and 10). (KC)

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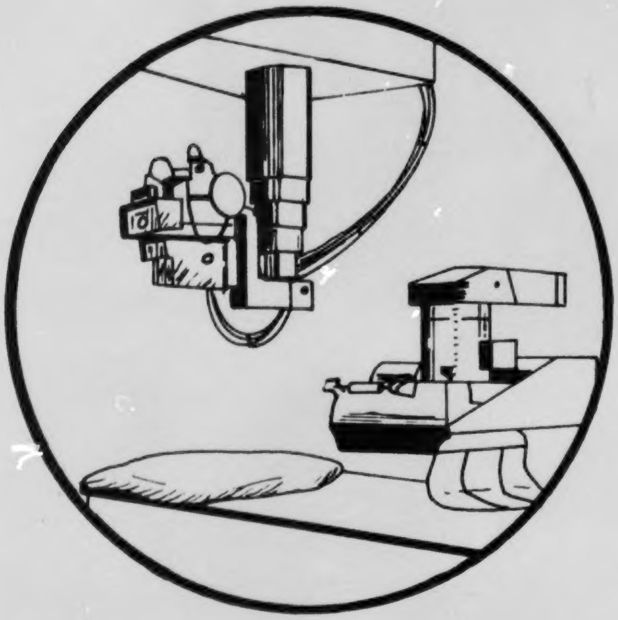
RADIOLOGICAL TECHNOLOGY

Post Secondary



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CURRICULUM GUIDE

Georgia Department of Education

RADIOLOGICAL TECHNOLOGY

Developed Under Contractual Agreement with

Division of Program Development
Office of Vocational Education
Georgia Department of Education
Atlanta, Georgia 30334
Charles McDaniel, State Superintendent of Schools
1981

RADIOGRAPHIC TECHNOLOGY

Developed By

The University of Georgia

Under the Direction of

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Division of Vocational Education

College of Education

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POLICIES AND PROCEDURES FOR THE CENTER

PURPOSE OF THE CENTER

The Vocational Education Materials Center functions within the Division of Vocational Education, University of Georgia. This Center operates under grants from the U.S. Office of Education, and the Georgia State Department of Education with the support of the College of Education. The Center is comprehensive in its commitment and approach to the development and dissemination of materials in the broad field of Vocational Education.

The purpose of the Center is to increase the capability of Georgia's delivery system for Vocational Education. Specifically, the Center is committed to:

1. Develop materials to assist in the implementation of proposed curricula and to enhance the teaching of Vocational Education.
2. Conduct and report curriculum research related to Vocational Education.
3. Provide a production and dissemination center for Vocational Education materials.
4. Provide direct experiences in curriculum development and diffusion for advanced graduate students.
5. Enable faculty members to participate in the development and implementation of a variety of curriculum materials.

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SECTION I

PHILOSOPHY & GOALS

VOCATIONAL EDUCATION IN GEORGIA

A. PHILOSOPHY

The Georgia Board of Education perceives vocational education as a vital component in the education of the young and adult citizens of this State. Appropriate programs of vocational education and ancillary services should be made readily available to individuals in middle schools, high schools, postsecondary area vocational-technical schools, vocational divisions of junior colleges, vocational centers, the Quick Start program and other adult programs designed to train or retrain workers for useful and satisfying employment.

Special services and assistance must be provided to those who need it in order to participate or benefit from vocational education. This includes women, minorities, the displaced homemaker and other displaced workers, those with limited English-speaking ability, the disadvantaged and the handicapped.

Since men and women spend the greater part of their lives at some form of work, the State should provide opportunities for all its citizens to develop the knowledge, skills and attitudes necessary for them to secure personally satisfying and socially useful employment.

B. PURPOSE

The purpose of vocational education shall be to improve the economic well-being of Georgia citizens by preparing individuals, through organized learning experiences, to select, obtain and advance in recognized occupations.

POSTSECONDARY VOCATIONAL EDUCATION

A. PURPOSE

The purpose of postsecondary vocational-technical education in Georgia is to improve the economic well-being of adult citizens by providing access to high quality vocational-technical training for skilled and semi-skilled occupations, for improvement of existing skills or for retraining in a new occupation.

B. OBJECTIVES

1. To provide vocational-technical education programs and ancillary services commensurate with the needs and interests of students and available job opportunities.

2. To provide vocational-technical education programs which are current with the state-of-the-art, competency-based, and offer multiple exit points to accomodate the students' occupational objectives.

3. To provide vocational-technical education programs which are articulated with available high school counterparts, to facilitate an easy transition from secondary to postsecondary levels without loss of credit.

4. To provide vocational-technical education programs such that 75% of those individuals who leave or complete a program of occupational preparation will find employment in the field, or a related field, for which trained.

5. To provide those guidance, counseling, financial aid, evaluative, job placement, remedial and other supportive programs and services needed by students to enroll, complete a program and become, or remain, employable in a skilled or semi-skilled occupation.

6. To provide needed assistance to special populations to include women, minorities, limited English-speaking, the displaced homemaker and other displaced workers, the disadvantaged and the handicapped.

7. To provide vocational-technical education programs for full-time and part-time students on campus during the day as well as the evening hours, and to provide appropriate programs for full-time and part-time students off campus in businesses and industries, comprehensive high schools and other locations within the respective schools' service areas.

8. To serve as a center for the delivery of postsecondary and adult vocational-technical education programs and services for the community and assigned service area.

STATEMENT OF LOCAL SYSTEM PHILOSOPHY, PURPOSE AND GOALS FOR VOCATIONAL EDUCATION

SECTION II

PURPOSE & OBJECTIVES

PURPOSE OF GUIDE

The purpose is defined in terms of the functional needs of each of the identified classes of users in the secondary and post secondary systems.

(a) Vocational teachers.

1. Provide a guide for organizing their program of instruction,
2. Assist in establishing program objectives,
3. Serve as a curriculum materials resource guide,
4. Improve communications with employers and advisory committees,
5. Facilitate competency based instruction,
6. Facilitate either group or self-paced instruction,
7. Include content by quarter and semester,
8. Cross-reference with existing state developed instructional materials (PLACE packages and post secondary I.I.).

(b) Vocational supervisors and administrators.

1. Assist in defining the scope and content of their programs,
2. Provide a means to improve curriculum management functions,
3. Serve as a guide for admissions and job placement functions,
4. Improve communications with employers and advisory committees.

(c) Counseling and guidance staff.

1. Provide a data base for counseling and guidance personnel,
2. Identify student exit points (Carrer Options),
3. Serve as guide for admissions and job placement,
4. Correlate with the new State Board of Education graduation requirements,
5. Provide specific content sequencing by quarter and semester for student scheduling,
6. Provide (a) curriculum options for the disadvantaged handicapped student, (b) curriculum modifications for SPECIAL NEEDS students, (c) typical admission requirements for regular and SPECIAL NEEDS students.

(d) Local Curriculum Coordination Committees.

1. Serve as a guide in working out articulation arrangements,
2. Improve definitions of the relationship between secondary clusters and post secondary specialized programs.

This guide will serve as an ideal communication device between school personnel and the craft advisory committee. By personally reviewing the guide with the local craft advisory committee the teacher will be able to maintain the accuracy of the guide in terms of the local job market and will also be able to inform representatives of local industry regarding the content of the program itself.

RADIOLOGICAL TECHNOLOGY PROGRAM OBJECTIVE

Given appropriate instruction, as suggested by this guide, a student completing the program should demonstrate entry level skills as a Radiographer in the areas of knowledge, theoretical structure, tool usage, diagnostic ability, related supportive skills and occupational survival skills.

SECTION III

D. O. T. DESCRIPTION, EXIT POINTS, TASKS

DESCRIPTION OF OCCUPATIONAL FIELD

The primary purpose of this section is to provide a general orientation to the occupational field. This orientation may be used by counseling and guidance staff in helping students to select subject areas. It may also be used by instructors for new students just entering the program area. The description delimits the scope of the occupational field in terms of the range of activities involved in a series of occupations. It contains information about career potential within the occupational field, including job market conditions and trends.

The description identifies prerequisite skills and knowledge for those students interested in entering the occupational field. A listing of employability skills is also included in this section.

DESCRIPTION OF OCCUPATION

Radiologic (X-ray) Technologists*
D.O.T. 078.162, .361-018, and .362-026

Nature of the Work

Bone fractures, ulcers, blood clots, and brain tumors are just a few of the medical problems that involve the use of X-rays in their treatment, either for diagnosis or therapy, X-rays of the chest also are taken during routine medical checkups to detect the presence of lung diseases in the early stages. The people who operate radiologic equipment and take X-ray pictures (known as radiographs) are called radiologic technologists or radiographers. They usually work under the supervision of radiologists--physicians who specialize in the use of radiographs.

Radiologic technologists may work in any of the three specialties within the field of radiologic technology. The most widely known specialty is X-ray technology or radiography, taking radiographs of parts of the human body for study by a radiologist in diagnosing a patient's problem. The other two are radiation therapy, the use of radiation-producing machines to give therapeutic treatments recommended by radiologists; and nuclear medicine technology, the application of radioactive material to help radiologists diagnose or treat illnesses or injuries.

Before a radiologic technologist can perform any work on a patient, a physician must issue a requisition ordering the work done. Similar to prescriptions for drugs, these requisitions assure that radiologic technologists treat only people certified as needing such treatment by physicians.

Radiologic technologists prepare patients for radiologic examinations, assuring that they remove any articles of clothing, such as belt buckles or jewelry, through which X-rays cannot pass. They then position the patients, either lying on a table or standing, so that the correct parts of the body can be radiographed, always taking care not to aggravate injuries or make the patients uncomfortable. To prevent unnecessary radiograph exposure to unaffected parts, the technologist surrounds the exposed area with radiation protection devices, such as lead shields.

After the necessary preparations, the technologist positions the radiologic machine at the correct angle and height over the appropriate area of a patient's body. Using instruments like a measuring tape, the technologist measures the thickness of the section to be radiographed. He or she sets the proper controls on the machine, such as those regulating exposure time, to produce radiographs of the right density, detail, and contrast. The technologist then places a properly identified X-ray film of the correct size under the part of the patient's body to be examined, and makes the exposure. Afterward, the technologist removes the film and develops it for interpretation by a radiologist. Throughout the procedure, the technologist is careful to use only as much radiation as is necessary to obtain a good diagnostic examination.

When examining a patient using fluoroscopy (watching a patient's internal body movements on a monitor or screen), the radiologic technologist prepares a solution of barium sulphate for the patient to drink. As this solution passes through the patient's digestive tract, a physician looks for diseases, injuries, or defects in the patient's digestive system. When fluoroscopic examinations are performed, whether on the digestive tract or on other parts of the body such as chest, heart, or bones, the technologist assists the physician by preparing and positioning the patient, adjusting the machine, and applying the correct exposure.

In radiation therapy, which is mainly used for treating cancer, the radiologic technologist works under the close supervision of a radiologist. Directed by a radiologist, the technologist applies the correct amount of radiation for the proper period of time to the affected part of the patient's body. The technologist also must keep adequate records of the treatment and its responsible for the comfort and safety of the patient during the treatment.

In nuclear medicine, the radiologic technologist also works under the direct supervision of a radiologist. The technologist prepares solutions containing radioactive material that, when swallowed by the patient or injected, is absorbed by the patient's internal organs. Because diseased tissues generally react differently from healthy ones when subjected to radioactive substances, it is possible to trace the development of disease. The technologist uses special cameras or scanners that pick up the radioactivity, and operates instruments that measure the intensity of the radioactivity.

In addition to the duties involved in operating radiologic equipment, radiologic technologists may have certain administrative tasks. Technologists prepare and maintain patients' records--keeping track of the developed film, the date it was taken, and the radiologist's diagnosis. They also may maintain files, schedule appointments, and prepare work schedules for assistants.

Some radiologic technologists are full-time instructors in radiography techniques, teaching in programs of radiologic technology.

Working Conditions

Radiologic technologists generally work a 40-hour week that may include evening or weekend hours. Technologists are on their feet a lot and may be required to lift or turn disabled patients.

There are potential radiation hazards in this field; however, these hazards have been greatly reduced by the use of safety devices such as instruments that measure radiation exposure, lead aprons, gloves, and other shielding.

Places of Employment

About 100,000 persons worked as radiologic technologists in 1978. Hospitals employ about three-fourths of all radiologic technologists; most of the remainder work in medical laboratories, physicians' and dentists' offices or clinics, Federal and State health agencies, and public school systems.

Training, Other Qualifications, and Advancement

The requirement for entry into this field is the completion of a formal education program in radiography. In 1978, about 1,100 programs in radiography offered by hospitals, medical schools affiliated with hospitals, colleges, and universities were accredited by the Committee on Allied Health Education and Accreditation of the American Medical Association (AMA).

Education also may be obtained in the military service or through courses in radiography offered by vocational or technical schools. Programs vary in length from 2 to 4 years. Some colleges award a bachelor's degree in radiologic technology. While employers generally pay graduates of bachelor's degree programs the same starting salaries as those of 2- and 3-year programs, there is more potential for promotion for those holding the bachelor's degree. It is advantageous for those planning to be educators or administrators in this filed to pursue the bachelor's and master's degrees as preparation.

All programs accept only high school graduates or the equivalent. Courses in mathematics, physics, chemistry, and biology are helpful.

Radiography programs include courses in anatomy, physiology, patient care procedures, physics, radiation protection, film processing, principles of radiographic exposure, medical terminology, radiographic positioning, medical ethics, and radiobiology.

Registration with the American Registry of Radiologic Technologists is an asset in obtaining highly skilled and specialized positions. Registration requirements include graduation from an accredited program of medical X-ray technology and the satisfactory completion of a written examination. After registration, the title "Registered Technologist (ARRT)" may be used. Once registered, technologists may be certified in radiation therapy or nuclear medicine by completing an additional year of combined classroom study and clinical education.

Good health, emotional stability, and a sincere desire to work with the sick and disabled are important qualifications for this profession.

As openings occur, some technologists in large radiography departments may qualify as instructors in radiography techniques or advance to supervisory radiologic technologists.

Sick leave, vacations, insurance, and other benefits are comparable to those covering other workers in the same organization.

Employment Outlook

Employment in the field of radiologic technology is expected to expand faster than the average for all occupations through the 1980's as radiologic equipment is increasingly used to diagnose and treat diseases. The demand for radiologic technologists also will increase as prepaid medical programs extend medical care to wider segments of the population. Part-time workers will find the best opportunities in physicians' offices and clinics where full-time radiologic services usually are not required.

Although the demand for radiologic technologists should continue to be strong, the number of graduates of AMA-accredited programs in this field also is expected to grow rapidly during the period. If present enrollment patterns continue, the number seeking to enter the occupation is likely to exceed the number of openings from growth and replacement needs. As a result, graduates may face competition for positions of their choice.

Related Occupations

Radiologic technologists operate sophisticated technical equipment to help physicians, dentists, and other medical practitioners diagnose and treat patients. Workers in related occupations include dental hygienists, electrocardiography technicians, electroencephalographic technologists, and medical technologists.

Sources of Additional Information

For additional information about programs and careers in radiologic technology, write: The American Society of Radiologic Technologists, 55 E. Jackson Blvd., Chicago, Ill. 60604.

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*From Occupational Outlook Handbook, 1980-81

EMPLOYABILITY SKILLS

In addition to the aptitudes, abilities, interests, physical requirements and job skills listed in the preceding Description of Occupation, employability skills exert a great deal of influence on a person's ability to get and keep a job. Surveys indicate that more people lose their jobs because of poor attitudes toward their job than for lack of job skills. For this reason it is important that information concerning the following employability skills be provided as an ongoing part of the program.

1. Getting a job
    a. Filling out job applications
    b. Developing a resume
    c. Preparing for a job interview

2. Keeping a job
    a. Be on time and regular in attendance
    b. Maintain a fair share of the work-load
    c. Work without supervision
    d. Meet production schedules
    e. Properly care for and use equipment
    f. Dress appropriately for the job
    g. Maintain good personal hygiene
    h. Develop and maintain good communication with supervisors and co-workers

SECTION IV

CURRICULUM STRUCTURE & COURSE OUTLINE

CURRICULUM STRUCTURE

The following curriculum structure is provided as a guide in developing a curriculum structure to fit local needs. The structure is based on the curriculum outline. The structure illustrated is not intended to imply there are not other ways to structure the curriculum.

The time estimates are based on a two year (eight quarter) program and may be adjusted as required for local programs and/or individual students. Classroom hours are based on a six (6) hour day and clinical hours are based on an eight (8) hour day. The actual amount of time required for each course will depend upon the instructor, the students and facilities available.

Each instructor is encouraged to structure their curriculum and make time estimates based on the minimum requirements, their own experience, students' needs and the local facilities (classroom, lab and clinic) available.

RADIOLOGIC TECHNOLOGY CURRICULUM STRUCTURE

Course Number	Course	Clock Hours
	First Quarter	
	Introduction to Radiologic Technology	21
	Methods of Patient Care	38
	Human Structure and Function	52
	Principles of Radiographic Exposure	14
	Radiographic Procedures I	50
	Clinical Practice (Practicum)	182
		357
	Second Quarter	
	Principles of Radiographic Exposure	44
	Film Critique	20
	Radiographic Procedures I	72
	Clinical Practice (Practicum)	234
		370
	Third Quarter	
	Radiologic Physics	68
	Processing	20
	Film Critique	20
	Clinical Practice (Practicum)	272
		380
	Fourth Quarter	
	Film Critique	20
	Clinical Practice (Practicum)	396
		416

Fifth Quarter

Principles of Radiographic Exposure	20
Radiographic Procedures II	42
Film Critique	20
Clinical Practice (Practicum)	306
	388

Sixth Quarter

Radiographic Procedures II	20
Radiation Protection	20
Imaging	17
Film Critique	20
Clinical Practice (Practicum)	312
	389

Seventh Quarter

Radiation Biology and Oncology	18
Pathology	20
Film Critique	20
Research Projects	10
Clinical Practice (Practicum)	328
	396

Eighth Quarter

Film Critique	20
General Review	50
Clinical Practice (Practicum)	320
	390

COURSE OUTLINE

The sample course outline is to be used as an example to facilitate the development of alternative outlines for the individual learner. The listing of the tasks within a quarter is not meant to indicate a required sequence or pattern. The specific information required to teach the skills for each task is included on the corresponding unit guide sheet in the Unit Guide section. In addition Related Information is included on separate unit guide sheets and listed in the course outline.

The time estimates are a minimum amount of time required and should be extended according to the individual learner's needs. The clinical hours may be rearranged according to the needs of the learners and to any constraints imposed by the clinical agency. The classroom hours include classroom laboratory practice and are based on a six (6) hour day. Clinical hours are based on an eight (8) hour day. The actual amount of time required for each course will depend upon the instructor, the student and facilities available.

Each instructor is encouraged to structure the courses and make time estimates based on the minimum requirements, their own experience, students' needs and the local facilities (classroom, lab and clinic) available.

Suggested Course Outline Structure for Radiologic Technology

Quarter I

Unit	Title	hours:minutes
	Introduction to Radiologic Technology	
1.01	Describing the history of radiology and radiography	2:30
1.02	Describing program guidelines and organization	2:30
1.03	Demonstrating a professional attitude	5:00
		8:00
	Maintaining Records	
2.01	Indexing and filing radiographs	1:00
2.02	Filing records such as correspondence, etc.	:30
2.03	Forwarding radiographic reports to physicians	:30
2.04	Processing loans of radiographs	:30
2.05	Maintaining radiology work record	1:00
2.06	Preparing supply requisitions	:30
2.07	Preparing charges and credits for patient billing	:30
2.08	Preparing safety and accident reports	:30
2.09	Checking for signed permit forms	:30
2.10	Interviewing and recording patient's medical history	:30
		5:30
	Radiation Protection	
3.01	Issuing and collecting radiation detectors such as film badges	:30
3.02	Providing radiation protection for self, co-workers and patients (Introduction)	5:00
		5:30
	Patient Care	
4.01	Washing hands	1:00
4.02	Caring for a patient receiving an IV infusion	1:00
4.03	Transporting a patient in a wheelchair	1:00

Patient Care (Continued)

4.04	Transporting a patient on a stretcher	1:00
4.05	Turning a patient in bed	2:00
4.06	Taking blood pressure	2:00
4.07	Taking pulse and respiration	1:00
		9:00

Emergency Procedures

5.01	Administering oxygen	1:00
5.02	Providing first aid for a shock victim	1:00
5.03	Providing first aid for a convulsing patient	1:00
5.04	Providing assistance for a vomiting patient	:30
5.05	Providing first aid for a patient who has fainted	:30
5.06	Administering CPR	6:00
5.07	Controlling external hemorrhage	1:00
5.08	Maintain emergency tray	1:00
		12:00

Preparation of Patients

6.01	Preparing patient for Radiographic Examination	:30
6.02	Handling patient with a skull or spine injury	1:00
6.03	Handling patient with a fractured hip or extremities	1:00
6.04	Restraining pediatric patients for radiographic examination	1:00
6.05	Administering contrast media rectally (or through stoma)	1:00
6.06	Administering contrast media orally	1:00
6.07	Preparing contrast media for intravenous injection	4:00
		9:30

Sterile/Isolation Procedures

7.01	Putting on and removing sterile gloves	1:00
7.02	Putting on and removing sterile gown	3:00
7.03	Putting on and removing mask	:30
7.04	Setting up sterile field	2:00
7.05	Scrubbing patient's skin	1:00
7.06	Making radiographs in the isolation unit	2:00
		9:30

Human Structure and Function

SF-1	General body plan and structural units	8:00
SF-2	Structure of bones and classification	4:00
SF-3	Muscular system	2:00
SF-4	Nervous system and special senses	8:00
SF-5	Transportation of materials through the body	10:00
SF-6	Systems responsible for maintaining metabolism of the body	12:00
SF-7	Integration and control of body functions by hormones	4:00
SF-8	Reproductive system	4:00
		52:00

Principles of Radiographic Exposure

PRE-1	Using mathematical calculations to determine exposure techniques	4:00
PRE-2	Describing the properties of electromagnetic radiation	4:00
PRE-3	Manipulating radiographic equipment	1:00
PRE-4	Setting the controls on the control panel	5:00
		14:00

Routine Radiographic Procedures

8.01	Positioning the patient in basic positions	4:00
8.02	Making radiographs of the chest	8:00
8.03	Making radiographs of the abdomen	8:00
8.04	Making radiographs of the upper extremity and shoulder girdle	12:00
8.05	Making radiographs of the lower extremity	10:00
8.06	Making radiographs of the pelvis and hips	8:00
		50:00

Clinical Practice	182:00
Quarter I Hours	357:00

Quarter II

Principles of Radiographic Exposure

		hours:minutes
PRE-5	Describing formation of the latent image	4:00
PRE-6	Determining correct values of milliampere-seconds, distance and kilovoltage for a specific radiographic projection	16:00
PRE-7	Selecting intensifying screens for radiographic examinations	6:00
PRE-8	Evaluating radiographs for image quality	14:00
PRE-9	Adjusting exposure techniques for unusual conditions	4:00
		44:00
	*Film evaluations in the form of weekly film critiques	20:00

Routine Radiographic Procedures

8.07	Making radiographs of the vertebral column	12:00
8.08	Making radiographs of the bony throax and soft tissue of the chest	10:00
8.09	Making radiographs of the cranial bones	10:00
8.10	Making radiographs of the facial bones	6:00
8.11	Making radiographs of the mandible, sinuses and temporal bones	8:00
8.12	Making radiographs using mobile X-ray units	6:00
8.13	Making radiographs in the operating room	6:00
8.14	Assisting with contrast radiographs and fluorographic studies	8:00
8.15	Making voiding cystourethrograms	4:00
8.16	Making intravenous pyelograms	4:00
8.17	Making intravenous cholangiograms	2:00
		72:00
Clinical Practice		234:00
	Quarter II Hours	370:00

Quarter III

Radiologic Physics

		hours:minutes
RP-1	Structure of matter	8:00
RP-2	Electrostatics and magnetism	4:00
RP-3	Electrical circuits	10:00
RP-4	X-Ray Generating Apparatus	16:00
RP-5	Production of X-rays and X-ray tubes	10:00
RP-6	Properties of X-rays	10:00
RP-7	Components of the X-ray circuit and equipment	10:00
		68:00

Processing

10.01	Loading film holders	1:00
10.02	Loading and unloading automatic film changers	4:00
10.03	Processing exposed film in automatic processor	1:00
10.04	Evaluating radiographs for processing artifacts	1:00
10.05	Cleaning film processing equipment	6:00
10.06	Making quality control checks for film processor	2:00
10.07	Testing safelight performance	1:00
10.08	Numbering cassettes and screens for identification	1:00
10.09	Cleaning intensifying screens	:30
10.10	Testing cassettes for screen contact	:30
10.11	Describing silver reclamation	2:00
		20:00

Film Critique	20:00
Clinical Practice	272:00
Quarter III Hours	380:00

Quarter IV

		hours:minutes
Film Critique		20:00
Clinical Practice		396:00
	Quarter IV Hours	416:00

Quarter V

Principles of Radiographic Exposure

PRE-10	Making fixed KV and variable KV technique charts	20:00

Special Radiographic Procedures

9.01	Loading automatic injectors	2:00
9.02	Assisting with arteriography	10:00
9.03	Assisting with venography	2:00
9.04	Assisting with myelography	2:00
9.05	Assisting with lymphangiograms	2:00
9.06	Assisting with hysterosalpinograms	2:00
9.07	Making pelvimetry radiographs	2:00
9.08	Making tomograms	4:00
9.09	Making stereoscopic radiographs	2:00
9.10	Making macroradiographs	2:00
9.11	Making radiographs for long bone measurements	2:00
9.12	Assisting with sialograms	2:00
9.13	Assisting with arthrograms	3:00
9.14	Assisting with bronchograms	3:00
9.15	Assisting with fistula or sinus tract radiographs	2:00
		42:00

Film Critique		20:00
Clinical Practice		306:00
	Quarter V Hours	388:00

Quarter VI

		hours:minutes
	Special Radiographic Procedures	
9.16	Make special views of the skeletal system	20:00
	Radiation Protection	
Pro-1	Interactions of radiation and matter	4:00
Pro-2	Quantities and units of measurement of radiation	5:00
3.02	Utilizing radiation protection devices	6:00
3.03	Evaluating radiation monitoring reports	5:00
		20:00
	Imaging	
11.01	Setting up fluoroscopic equipment	4:00
11.02	Loading and unloading photospot camera	1:00
11.03	Setting up video recording equipment	2:00
11.04	Making sonograms	2:00
11.05	Making xeroradiographs	2:00
11.06	Making thermograms	1:00
11.07	Exposing and developing poloroid film packet	1:00
11.08	Making computed tomography scans	4:00
11.09	Duplicating radiographs	1:00
11.10	Subtracting radiographs	1:00
		19:00
Film Critique		20:00
Clinical Practice		311:00
	Quarter VI Hours	370:00

Quarter VII

hours:minutes

Radiation Biology and Oncology

RBO-1	Describing long and short term biological effects of radiation	4:00
RBO-2	Factors influencing the response of organisms to radiation	4:00
RBO-3	Genetic effects of radiation exposure	2:00
RBO-4	Effects of radiation on the embryo	1:00
RBO-5	Radiation and immunity	1:00
RBO-6	Radiation therapy in the management of cancer	6:00
		18:00

Pathology

P-1	Sources of disease	2:00
P-2	Disturbances in blood flow and body fluids	2:00
P-3	Inflammation, infection and repair of tissue	4:00
P-4	Degenerative diseases	2:00
P-5	Common disease affecting body systems	10:00
		20:00

Film Critique	20:00
Research Projects	10:00
Clinical Practice	328:00
Quarter VII Hours	396:00

Quarter VIII

Film Critique	20:00
General Review	50:00
Clinical Practice	320:00
Quarter VIII Hours	390:00

SECTION V

UNIT GUIDES

UNIT GUIDES

Description

The unit guides in this section are divided into two groups: Related Instruction and Tasks. The Related Instruction consists of cognitive skills, many of which are prequisite to the tasks or psychomotor skills. Each unit of Related Instruction and each task is listed on a separate page so that they may be taken out of the guide for daily lesson planning or reqrouped with other tasks to fit the individual instructor's own preference for the teaching order. The task pages may be used for planning and executing group instruction or for individualized instruction. Each page in the UNIT GUIDES section contains the following information:

TASK: This is a short and concise statement of the task to be taught.

PERFORMANCE OBJECTIVE: The performance expected of the student after completing the unit is stated in stem form, without a specific statement of all conditions, equipment, and performance standard (these are listed in a criterion referenced measure in the Evaluation section of the task page).

INSTRUCTIONAL ACTIVITIES: Suggested learning activities are presented. These activities include providing information, demonstration, use of audio-visuals, and practical applications.

INSTRUCTIONAL MATERIALS: The materials that are necessary to carry out the instructional activities are listed.

These include instructional units, textbooks, audio-visuals and equipment.

EVALUATION: This section contains a criterion referenced measure (where appropriate) and reference to any test items or other evaluation measures that are available to the teacher. The criterion referenced measure contains three parts--Condition, Performance and Standard.

CLASSROOM HOURS: The estimated time for completion of the instructional activities and evaluation are indicated. This time estimate is stated in hours of classroom time and includes classroom laboratory time. Clinical or practicum hours are not listed on the unit guide sheets; however, they are listed in the curriculum structure and course outline in section IV.

TASK

SF-1 Describing the general body plan and structural units.

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the general body plan and structural units.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

1.00 Introduction to
Radiologic Technology

Provide Information On:

a. Body cavities
b. Body planes
c. Anatomical position
d. Calls
e. Transport of substances across membranes
f. Types of tissues
g. Skin

INSTRUCTIONAL MATERIALS

Textbooks:

a. Deinhart
b. Jacobi

CLASSROOM HOURS 8

EVALUATION (SF-1)

Given the necessary information and related instruction, the learner will describe the general body and structural units. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

SF-2 Describing the structure and classifications of bones

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the structure and classification of bones.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

SF-1 Describing the general body plan and structural units

Provide Information On:

a. Functions of the skeletal system
b. Bone structure
c. Ossification
d. Classification of bones
e. Classifications of joints

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dienhart
b. Jacobi
c. Merrill

CLASSROOM HOURS 4

EVALUATION (SF-2)

Given the necessary information and related instruction, the learner will describe the structure and classification of bones. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

SF-3 Describing muscles that cast a shadow on radiographs

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the muscles that cast a shadow radiographically.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

SF-1 Describing the general body plan and structural units

Provide Information On:

a. Properties of muscle tissue
b. Types of muscle tissue
c. Functions of muscles
d. Muscles important radiographically

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dienhart
b. Jacobi

CLASSROOM HOURS 2

EVALUATION (SF-3)

Given the necessary information and related instruction, the learner will describe the muscles that cast a shadow on radiographs. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

SF-4 Describing the nervous system and special senses

PERFORMANCE OBJECTIVE

Proveded with the necessary information and related instruction, describe the nervous system and special senses.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

SF-1 Describing the general body plan and structural units

Provide Information On:

a. Nerve cells
b. Brain and cord coverings
c. Fluid spaces in the brain and spinal cord
d. Brain anatomy
e. Cranial and spinal nerves
f. Autonomic nervous system
g. Internal structure of the eye
h. Structure of the ear
i. Physiology of smell and taste
j. Radiographic examination of the nervous system

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dienhart
b. Jacobi

CLASSROOM HOURS 8

EVALUATION (SF-4)

Given the necessary information and related instruction, the learner will describe the nervous system and spinal cord. Evaluation will by by written examination and based on criteria specified by the instructor.

TASK

SF-5 Describing the transportation of materials through the body

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the transportation of materials through the body.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

SF-1 Describing the general body plan and structural units

Provide Information On:

a. Composition of the blood
b. Blood clotting mechanism
c. Blood types or groups
d. Anatomy of the heart
e. Structure and function of arteries, veins and capillaries
f. Systemic, pulmonary and portal circulation
g. Factors affecting blood pressure
h. Major arteries and veins
i. Lymph circulation
j. Structure and function of lymphatics and lymph nodes.
k. Radiographic examination of the circulatory and lymphatic systems

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dienhart
b. Jacobi
c. Merrill

CLASSROOM HOURS 10

EVALUATION (SF-5)

Given the necessary information and related instruction, the learner will describe the methods of transporting materials through the body. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

SF-6 Describing the functions of the systems responsible for maintaining metabolism

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the structure and functions of the body systems responsible for maintaining metabolism.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

SF-1 Describing the general body plan and structural units

Provide Information On:

a. Anatomy of the respiratory passages
b. Structure of the lungs
c. Physiology of respiration
d. Anatomy of the alimentary canal
e. Physiology of digestion
f. Anatomy of accessory digestion organs
g. Structure of the urinary system
h. Internal structure of the kidneys
i. Radiographic examinations of the respiratory, digestive, and urinary systems

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dienhart
b. Jacobi
c. Merrill

CLASSROOM HOURS 12

EVALUATION (SF-6)

Given the necessary information and related instruction, the learner will describe the body systems responsible for maintaining metabolism. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

SF-7 Describing the integration and control of body functions by hormones

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the intergration and control of body functions by hormones.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

SF-1 Describing the general body plan and structural units

Provide Information On:

a. Function of endocrine system
b. Location of pituitary, thyroid, parathyroids, and adrenals
c. Hormones secreted by endocrine glands and their functions
d. Function and location of the pancreas, ovaries, testis, thymus and pineal glands
e. Mechanisms for maintaining homeostasis of fluid volume and distribution
f. Radiographic examination involving the endocrine glands

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dienhart
b. Jacobi

CLASSROOM HOURS 4

EVALUATION (SF-7)

Given the necessary information and related instruction, the learner will describe the control of body functions by hormones. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

SF-8 Describing the reproductive systems

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the male and female reproductive systems.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

SF-1 Describing the general body plan and structural units

Provide Information On:

a. Structure of vessels and glands in the male reproductive system
b. Structure of the female reproductive system.
c. Spermatogenesis and oogenesis
d. Fertilization and embryology
e. Structure of mammary gland
f. Radiographic studies of the reproductive system

INSTRUCTIONAL MATERIALS

Textbooks:

a. Dienhart
b. Jacobi

CLASSROOM HOURS 4

EVALUATION (SF-8)

Given the necessary information and related instruction, the learner will describe the structure and function of the reproductive system. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

PRE-1 Using mathematical calculations to determine exposure techniques

PERFORMANCE OBJECTIVE

Provided with the necessary tools, use mathematical calulations to determine correct exposure techniques.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Metric system
b. Converting decimal expressions to fractions and vice versa
c. Algebraic expression involving ratios, proportions, square toots, fractions, decimals
d. Fundamental units
e. Derived units

Demonstration of Task:

By instructor

Laboratory Practice:

Have the learner practice mathematical calculations in the classroom and in the laboratory

Clinical Application:

Have the learner use calculations in the clinical area to determine exposure techniques

INSTRUCTIONAL MATERIALS

Textbooks:

a. Selman
b. Thompson, Cahoon's

Equipment:

a. Paper
b. Pen or pencil
c. Calculator (optional)

CLASSROOM HOURS 4

EVALUATION (PRE-1)

Given the necessary tools, the learner will use mathematical calculations to determine exposure techniques. Correct exposure techniques must be calculated to within 90% of the instructor's.

TASK

PRE-2 Describing the properties of electromagnetic radiation

PERFORMANCE OBJECTIVE

Provided with information and related instruction, describe the properties of electromagnetic radiation.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. The electromagnetic spectrum
b. Wave concept of electromagnetic radiation
c. Relationship of velocity, frequency and wavelength
d. Particle concept of electromagnetic radiation
e. Relationship between photon energy and wavelength
f. Properties of X-rays

Provide A/Vs On:

Properties of radiation

INSTRUCTIONAL MATERIALS

Textbooks:

a. Christensen
b. Selman

A/Vs:

Multi-media, "X-ray Production"

CLASSROOM HOURS

4

EVALUATION (PRE-2)

Given the necessary information and related instruction, the learner will describe the properties of electromagnetic radiation. Evaluation will be based on written examination with performance criteria established by the instructor.

TASK

PRE-3 Manipulating radiographic equipment

PERFORMANCE OBJECTIVE

Provided with a radiographic room, identify and manipulate the X-ray tube and collimator, the X-ray table and accessories.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

1.00 Introduction to Radiography

Provide Information On:

- a. Room layout
- b. Name and function of equipment in the X-ray room
- c. Location of locks
- d. Location of table and tube controls
- e. Moving the table and tube
- f. Correct placement of cassettes in passboxes
- g. Placement of cassettes in Bucky tray
- h. Location of safety equipment

Demonstration of Task:

By instructor or room supervisor

Laboratory Practice:

- a. Practice moving the tube, including angling in all directions
- b. Angulate the table and move the tabletop
- c. Place cassettes in Bucky tray and passbox
- d. Align collimator

Clinical Application:

Have the learner manipulate the equipment in the clinical area

INSTRUCTIONAL MATERIALS

Equipment:

Equipted X-ray room

CLASSROOM HOURS 1

EVALUATION (PRE-3)

Given a radiographic room, the learner will manipulate the X-ray tube and collimator, the X-ray table and accessories so that all movements are smooth and the equipment is not damaged.

TASK

PRE-4 Setting the controls on the control panel

PERFORMANCE OBJECTIVE

Provided with a control panel for a radiographic unit and a radiographic technique, set the MA, time, KVP and other necessary controls.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

1.00 Introduction to Radiography

Provide Information On:

a. Location and purpose of controls and meters on the control panel
b. Operation of the controls (pushbutton, etc.)
c. Calculating MAS
d. Routine settings for types of examinations

Demonstration of Task:

By instructor

Laboratory Practice:

Have the learner practice setting several techniques

Clinical Application:

Have the learner set the controls for radiographic examinations in the X-ray dept.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Selman
b. Thompson

CLASSROOM HOURS 5

EVALUATION (PRE-4)

Given the control panel for a radiographic unit and a radiographic technique, the learner will set the controls. All controls must be accurately set for the given technique.

TASK

PRE-5 Describing formation of the radiographic image

PERFORMANCE OBJECTIVE

Provided with information and related instruction, describe the formation of the radiographic image.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

PRE-2 Describing the properties of electromagnetic radiation

Provide Information On:

a. Construction of radiographic film
b. Types of radiographic film
c. Exposure and latest image formation
d. Conversion of latent image to visible image
e. Oxidation and reduction in relation to image formation

Laboratory Practice:

a. Draw a diagram of the latent image formation and development
b. Draw and label a cross-section of radiographic film

INSTRUCTIONAL MATERIALS

Textbooks:

a. Thompson, Cahoon's
b. Selman
c. Christensen

CLASSROOM HOURS 4

EVALUATION (PRE-5)

Given the necessary information and related instruction, the learner will describe the formation of the radiographic image. Evaluation will be written with performance criteria established by instruction.

TASK

PRE-6 Determining milliampere-seconds, distance and kilovoltage for a specific radiographic projection

PERFORMANCE OBJECTIVE

Provided with a patient and physician's orders, determine the correct values of milliampere-seconds, distance and kilovoltage for a specific projection.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 3.00 Patient care
b. PRE-1 Using mathematical calculations to determine exposure techniques
c. PRE-3 Manipulating radiographic equipment
d. PRE-4 Setting the controls on the control panel

Provide Information On:

a. Definitions of prime factors
b. Effect of each of the prime factors on radiographic quality
c. Relationship between milliampere and time
d. Inverse square law
e. Relationship between distance and millampere seconds
f. Effect of kilovoltage on the X-ray beam
g. Relationship between KU and contrast

Provide A/Vs On:

Factors in the production of a radiograph

Demonstration of Task:

By instructor

Laboratory Practice:

a. Determine correct exposure techniques for radiographic procedures in the laboratory

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Thompson, Cahoon's
b. Selman
c. Hiss
d. Christensen
e. Bushong
f. U.S. Dept. of Health and Human Services

A/Vs:

Multi-media-
a. "Introduction to the Physics of Diagnostic Radiology"
b. Christensen, "Low Dosage Medical Radiography and Geometry of Image Formation"

CLASSROOM HOURS 16

EVALUATION (PRE-6)

Given a patient and physician's orders, the learner will determine the correct valves of milliampere-seconds, distance and kilovoltage for a specific projection. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

	RATING	
ACTIVITY	Acceptable	Unacceptable
1. Correct anatomical part was demonstrated.		
2. Aligned part, film and central ray properly.		
3. Used correct exposure factors.		
4. Identified film (Right and Left of Patient).		

TASK

PRE-7 Selecting intensifying screens for radiographic examinations

PERFORMANCE OBJECTIVE

Provided with a specific radiographic examination, select the appropriate intensifying screen.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 3.02 Providing radiation protection
b. PRE-1 Using mathematical calculations to determine exposure techniques
c. PRE-2 Describing the properties of electromagnetic radiation
d. PRE-3 Manipulating radiographic equipment
e. PRE-4 Setting the controls on the control panel
f. PRE-5 Describing formation of the latent image

Provide Information On:

a. Fluorescence and phosphorescence
b. Factors affecting screen speed
c. Construction of intensifying screens
d. Effect of screen speed on detail
e. Patient exposure with different screen speeds
f. Poor screen contact
g. Effect of screens on radiographic quality
h. Phosphors used in intensifying screens
i. Screen conversion factors

Provide A/Vs On:

Intensifying screens

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Thompson, Cahoon's
b. Selman
c. Christensen

A/Vs:

Slide presentations available from equipment manufacturers

Equipment:

a. X-ray machine
b. Various screen speeds
c. X-ray film

CLASSROOM HOURS 6

EVALUATION PRE-7

Given a specific radiographic examination, the learner will select the appropriate intensifying screen and make an exposure using the screen. The processed radiograph should exhibit the appropriate density, contrast and detail according to the criteria established by the instructor.

INSTRUCTIONAL ACTIVITIES

Demonstration of Task:

By instructor

Laboratory Practice:

Have the learner perform experiments to evaluate screen speed verses radiation exposure and screen speed verses radiographic quality

Clinical Application:

Have the learner select appropriate screens for radiographic examinations

TASK

PRE-8 Evaluating radiographs for image quality

PERFORMANCE OBJECTIVE

Provided with a radiograph, determine if the correct exposure factors have been used.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. PRE-1 Using mathematical calculations to determine correct exposure
b. 10.04 Evaluating radiographs for processing artifacts

Provide Information On:

a. Density
b. Contrast
c. Definition
d. Distortion/magnification
e. Factors influencing radiographic quality
f. Long and short scale contrast
g. Geometry of image formation
h. Desirable radiographic qualities

Provide A/Vs On:

Radiographic quality

Laboratory Practice:

Have the learner evaluate radiographs in the laboratory for correct contrast, density, definition and distortion

Clinical Application:

Have the learner evaluate radiographs in the clinical area

INSTRUCTIONAL MATERIALS

Textbooks:

a. Thompson, Cahoon's
b. Hiss
c. Selman
d. Christensen
e. Bushong
f. U.S. Dept. of Human Services

A/Vs:

Multi-media-
a. "Introduction to the Physics of Diagnostic Radiography"
b. Christensen, "Low Dosage Medical Radiography and Geometry of Image Formation"

CLASSROOM HOURS 14

EVALUATION (PRE-8)

Given a radiograph, the learner will evaluate it for correct density, contrast, definition and distortion. The learner's evaluation must agree with that of the instructor.

TASK

PRE-9 Adjusting exposure techniques for unusual conditions

PERFORMANCE OBJECTIVE

Provided with a patient and physician's orders for a specific procedure, adjust exposure techniques for unusual conditions.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. PRE-1 Using mathematical calculations to determine exposure techniques
b. PRE-3 Manipulating radiographic equipment
c. PRE-4 Setting controls on the control panel
d. PRE-6 Determing milli-ampere-seconds, distance and kilovoltage for a specific radiographic projection
e. PRE-8 Evaluating radiographs for image quality

Provide Information On:

a. Body types according to Mills
b. Topographic location of internal organs according to body type
c. Diseases that cause decreased radiopacity
d. Diseases that cause increased radiopacity

Demonstration of Task:

By instructor

Laboratory Practice:

a. Describe topographic location of internal organs on people of different size
b. Identify different body types by position of organs on radiographs

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

Thompson, Cahoon's

CLASSROOM HOURS

4

(continued from front page) PRE-9

INSTRUCTIONAL ACTIVITIES

Laboratory Practice:

c. Adjust exposure techniques for different pathological conditions in the lab

Clinical Application:

Have the learner make adjustments for anatomic and pathologic charges in the X-ray department

EVALUATION (PRE-9)

Given a patient and physician's orders, the learner will adjust exposure techniques for unusual conditions. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Correct anatomical part was demonstrated.		
2. Aligned part, film and central ray properly.		
3. Used correct exposure factors.		
4. Identified film (Right and Left of Patient).		

TASK

PRE-10 Making fixed KV and variable KV technique charts

PERFORMANCE OBJECTIVE

Provided with an X-ray machine and radiographic phantom, make technique charts.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. PRE-1 through 9
b. RP-1 through 7

Provide Information On:

a. Factors affecting image quality
b. Technical conversion charts
c. Radiographic equipment limitations
d. Radiographic accessories
e. Types of technique charts
f. Converting techniques from one machine to another

Laboratory Practice:

Have the learner make technique charts using the phantom patient

INSTRUCTIONAL MATERIALS

Textbooks:

Thompson, Cahoon's

Equipment:

a. X-ray machine
b. Films and cassettes
c. Sample charts
d. Phantom

CLASSROOM HOURS 20

EVALUATION (PRE-10)

Given an X-ray machine and phantom, the learner will make fixed KV and variable KV technique charts. The charts must provide information capable of diagnostic radiographs of the phantom.

TASK

RP-1 Describing the structure of matter

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the structure of matter at the atomic and subatomic levels.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Bohr theory of atomic structure
b. Energy levels in the atom
c. Characteristics of elements.
d. Compounds
e. Substances
f. Mixtures
g. Ionization
h. Methods of Ionization
i. Radioactivity

Provide A/V On:

Structure of Matter

INSTRUCTIONAL MATERIALS

Textbooks:

a. Selman
b. Christensen

A/Vs:

Multi-media, "Matter, Energy and the Nuclear Atom"

CLASSROOM HOURS 8

EVALUATION (RP-1)

Given the necessary information and related instruction, the learner will describe the structure of matter at the atomic and subatomic levels.

Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

RP-2 Describing electrostatics and magnetism

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe electrostatics and magnetism.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

RP-1 Describing the structure of matter

Provide Information On:

a. Laws of electrostatics
b. Electrification
c. Lines of force
d. Capacitors
e. Electroscopes
f. Static discharge
g. Properties of magnets
h. Magnetic poles and fields
i. Magnetic induction
j. Types of magnets

INSTRUCTIONAL MATERIALS

Textbooks:

a. Selman
b. Christensen

CLASSROOM HOURS 4

EVALUATION (RP-2)

Given the necessary information and related instruction, the learner will describe electrostatics and magnetism. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

RP-3 Describing electrical circuits

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the properties of AC and DC circuits.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. RP-1 Describing the structure of matter
b. RP-2 Describing electrostatics and magnetism

Provide Information On:

a. Essentials of an electric circuit
b. Units for measuring current
c. Properties of electric circuits
d. Ohm's law
e. Alternating and direct current
f. Three phase vs single phase current
g. Electric measuring instruments
h. Electrical safety

Provide A/V On:

Electric Circuits
Electrical Safety

INSTRUCTIONAL MATERIALS

Textbooks:

a. Selman
b. Christensen

A/Vs:

a. Multi-media, "X-Ray Production"
b. Multi-media, "Electrical Hazards in the X-Ray Department"
c. ASRT, "Energy, Ohms Law and Basic Circuits"

CLASSROOM HOURS 10

EVALUATION (RP-3)

Given the necessary information and related instruction, the learner will describe electrostatics and magnetism. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

RP-4 Describing X-Ray generating apparatus

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe X-ray generating equipment.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. RP-1 Describing the structure of matter
b. RP-2 Describing electrostatics and magnetism
c. RP-3 Describing electrical circuits

Provide Information On:

a. Electromagnetic induction
b. Generators and motors
c. Transformers
d. Devices for controlling voltage
e. Thermionic emission
f. Types of rectification
g. Value tube vs solid state rectifiers

Provide A/V On:

X-Ray generating apparatus

INSTRUCTIONAL MATERIALS

Textbooks:

a. Selman
b. Christensen

A/Vs:

ASRT, "Modern X-Ray Tubes and Generators"

CLASSROOM HOURS 16

EVALUATION (RP-4)

Given the necessary information and related instruction, the learner will describe X-ray generating equipment.

Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

RP-5 Describing the production of X-rays and X-ray tubes

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the production of X-rays in modern X-ray tubes

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. RP-1 Describing the structure of matter
b. RP-2 Describing electrostatics and magnetism
c. RP-3 Describing electrical circuits
d. RP-4 Describing X-ray generating apparatus
e. Stationary anode tubes
f. Rotating anode tubes
g. Therapy tubes
h. Field emission X-ray tubes
i. Tube cooling and housing
j. Tube characteristics
k. Focal spots
l. Tube rating charts

Provide Information On:

a. Conditions necessary for X-ray productions
b. Bremsstrabling and characteristic radiation
c. Basic components of X-ray tubes
d. Target material and construction

Provide A/V On:

X-ray production

INSTRUCTIONAL MATERIALS

Textbooks:

a. Selman
b. Christensen
c. Thompson, Equipment

A/Vs:

Multi-media, "X-ray Production"

CLASSROOM HOURS 10

EVALUATION (RP-5)

Given the necessary information and related instruction, the learner will describe the production of X-rays in modern X-ray tubes. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

RP-6 Describing properties of X-rays

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the properties of X-rays

INSTRUCTIONAL ACTIVITIES

Prerequisites:

RP-1 Describing the structure of matter

Provide Information On:

a. Properties of X-rays
b. Interactions of radiation and matter
c. Relationship of interactions to radiographic quality and biological effects
d. Specifications of the X-ray beam
e. X-ray dosimetry

Provide A/V on:

Properties of X-rays

INSTRUCTIONAL MATERIALS

Textbooks:

a. Selman
b. Christensen

A/Vs:

Multi-media, "Interaction with Matter and Properties of Radiographs"

CLASSROOM HOURS 10

EVALUATION (RP-6)

Given the necessary information and related instruction, the learner will describe the properties of X-rays. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

RP-7 Identifying components of the X-ray circuit and equipment

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, identify components of the X-ray circuit and equipment.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. RP-1 Describing the structure of matter
b. RP-2 Describing electrostatics and magnetism
c. RP-3 Describing electrical circuits
d. RP-4 Describing X-ray generating apparatus
e. RP-5 Describing the production of X-rays and X-ray tubes

Provide Information On:

a. Components of the primary circuit
b. Components of the high-voltage circuit
c. Single phase vs three phase equipment
d. Field emission X-ray equipment
e. Capacitive discharge X-ray equipment
f. Generator rating and capacity

INSTRUCTIONAL MATERIALS

Textbooks:

a. Selman
b. Thompson, Equipment
c. Christensen

CLASSROOM HOURS 10

EVALUATION (RP-7)

Given the necessary information and related instruction, the learner will identify the components of the X-ray circuits and equipment. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

Pro-1 Explaining interactions of radiation and matter

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the three (3) types of proton interactions with matter.

INSTRUCTIONAL ACTIVITIES

Prerequisite tasks:

a. RP-1 Describing the structure of matter.
b. RR-6 Describing the properties of X-rays

Provide Information On:

a. Photoelectric interaction
b. Compton interaction
c. Pair production
d. Electron interactions
e. Effect of interactions on organisms
f. Effect of interactions on film quality

Provide A/Vs On:

Interactions of radiation and matter

Laboratory practice:

Have the learner

a. prepare a table describing each interaction, photon energy, electron shell, and result of interaction.
b. diagram each interaction.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Selman
b. Christensen
c. Frankel

A/Vs:

Multi-Media, "Introduction to Radiation Physics Technology: Interactions of Radiation With Matter"

CLASSROOM HOURS 4

EVALUATION (Pro-1)

Given the necessary information and related instruction, the learner will describe the interactions of radiation and matter. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

Pro-2 Listing the quantities and units of measurement of radiation

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, list the quantities and units of measurement of radiation.

INSTRUCTIONAL ACTIVITIES

Prerequisite tasks:

a. RP-1 Describing the structure of matter
b. RP-2 Describing the properties of X-rays

Provide Information On:

a. Exposure
b. Absorbed dose
c. Dose equivalent
d. Roentgen
e. Rem
f. Rad
g. Interrelationships of the units of radiation
h. Calculating units of radiation
i. Instruments used to measure radiation

Provide A/Vs On:

Quantities and units of measurement of radiation

Laboratory Practice:

Have the learner

a. perform experiments using an R-meter to measure exposure.
b. practice calculations with the units of radiation.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Frankel
b. Selman
c. Christensen

A/Vs:

Multi-media

a. "Radiological Health"
b. "Radiation Protection"

Equipment:

a. X-ray machine
b. R-meter

CLASSROOM HOURS

5

EVALUATION (Pro-2)

Given the necessary information and related instruction, the learner will list the quantities and units of measurement of radiation. Evaluation will be by written examination and based on criteria specified by instructor.

TASK

RBO-1 Describing long and short term biological effects of radiation

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the long and short term biological effects of radiation.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. SF-1 Describing the component parts of the human body
b. Pro-1 Explaining interactions of radiation and matter
c. Pro-2 Listing the quantities and units of measurement of radiation

Provide Information On:

a. Direct and indirect effects
b. Threshold and non-threshold theories
c. Long term somatic effects
d. Short term somatic effects
e. Latent period for long and short term effects
f. Statistical risk
g. Examinations which may involve a somatic risk

Provide A/Vs On:

Biological effects of radiation

(Continued on back)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Frankel
b. Selman
c. Christensen
d. Travis
e. Pizzarello

A/Vs:

Multi-Media

a. "Radiological Health"
b. "Radiation Protection"

CLASSROOM HOURS	4

EVALUATION (RBO-1)

Given the necessary information and related instruction, the learner will describe long and short term biological effects of radiation exposure. Evaluation will be by written examination and based on criteria specified by the instructor.

INSTRUCTIONAL ACTIVITIES (Continued)

Laboratory practice:

Have the learner:

a. differentiate between long and short term effects.

b. graphically compare threshold vs non-threshold theories.

c. list examinations which may involve a significant somatic risk.

TASK

RBO-2 Describing the factors influencing the response of organisms to radiation

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the factors influencing the response of organisms to radiation.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

SF-1 Describing the general body plan and structual units

Provide Information On:

a. Relative biological effectiveness
b. Effect of dose rate and dose
c. The oxygen effect
d. Effect of type of tissue, age, stress
e. Free radical formation
f. LD 50/30
g. Radiation syndromes
h. Law of Bergonie and Tribondeau

INSTRUCTIONAL MATERIALS

Textbooks:

a. Frankel
b. Travis
c. Pizzarello

CLASSROOM HOURS	4

EVALUATION (RBO-2)

Given the necessary information and related instruction, the learner will describe the factors affecting the response of organisms to radiation. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

RBO-3 Describing the genetic effect of radiation exposure

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the genetic effect of radiation exposure.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. RBO-1 Describing long and short term biological effects of radiation
b. RBO-2 Describing the factors influencing the response of organisms to radiation

Provide Information On:

a. The structure of the DNA molecule
b. Genetic information or code
c. Mutations in terms of the DNA molecule
d. Genetic mutation vs somatic mutation
e. Gene mutations vs chromosome aberrations
f. Mutagenic effects of radiation
g. Effect of dose and dose rate on mutation frequency
h. Effect of medical and dental radiation on mutation frequency

INSTRUCTIONAL MATERIALS

Textbooks:

a. Travis
b. Frankel
c. Pizzarello

CLASSROOM HOURS	2

EVALUATION (RBO-3)

Given the necessary information and related instruction, the learner will describe the genetic effect of radiation exposure. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

RBO-4 Describing the effects of radiation on the embryo

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the effects of radiation on the embryo.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. RBO-1 Describing long and short term biological effects of radiation
b. RBO-2 Describing the factors influencing the response of organisms to radiation

Provide Information On:

a. Reasons for radiosensitivity of the embryo
b. Importance of loss of few embryonic cells
c. Results of exposure to the embryo
d. Most radiosensitive time during pregnancy
e. Best time to irradiate a female (of child-bearing age)
f. Risk involve in viro-diating a female during late pregnancy

INSTRUCTIONAL MATERIALS

Textbooks:

a. Pizzarello
b. Travis
c. Frankel

CLASSROOM HOURS	1

EVALUATION (RBO-4)

Given the necessary information and related instruction, the learner will describe the effects of radiation on the embryo. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

RBO-5 Describing the effects of low radiation on immunity

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the effects of low radiation on immunity.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. RBO-1 Describing long and short term biological effects of radiation
b. RBO-2 Describing the factors influencing the response of organisms to radiation

Provide Information On:

a. Immunity and immune responses
b. Antibody and antigen reaction
c. Function of lymphocytes
d. Effect of radiation on lymphocytes
e. Correlation of irradiation of organism with survival of transplanted organ
f. Effects of radiation on defense mechanisms
g. Effect of radiation on tissue rejection

INSTRUCTIONAL MATERIALS

Textbooks:

a. Pizzarello
b. Travis

CLASSROOM HOURS 1

EVALUATION (RBO-5)

Given the necessary information and related instruction, the learner will describe the effects of low radiation on immunity. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

RBO-6 Explaining the role of radiation therapy in the management of cancer

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the role of radiation therapy in the management of cancer.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. RBO-2 Describing the factors influencing the response of organisms to radiation
b. Pro-2 Listing the quantities and units of measurement of radiation
c. Pro-1 Explaining interactions of radiation and matter

Provide Information On:

a. Three main methods of cancer treatment
b. Terms related to cancer and radiation therapy
c. Sources of radiation used in therapy
d. Common pathologics treated with radiation therapy
e. Spread of malignant disease
f. Radiobiologic basis of radiation therapy
g. Duties of the therapy technologist
h. Importance of record-keeping and long term patient follow up

(Continued on back)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Boyd and Shelton
b. Selman

CLASSROOM HOURS 6

EVALUATION (RBO-6)

Given the necessary information and related instruction, the learner will describe the role of radiation therapy in the treatment of cancer. Evaluation will be by written examination and based on criteria specified by the instructor.

INSTRUCTIONAL ACTIVITIES (Continued)

Clinical Practice:

Have the learner observe and assist the radiation therapy technologist with therapy treatments.

TASK

P-1 Listing sources of disease

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, identify the causes of disease.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Terminology pertaining the diagnoses
b. Hereditary and congenital diseases
c. Trauma
d. Physical agents (heat, cold, radiation)
e. Chemical poisons
f. Infections
g. Inflammation
h. Vascular disease
i. Metabolic disease
j. Nutritional disease
k. Drugs
l. Psychogenic disease
m. Iatrogenic disease
n. Idiopathic disease

INSTRUCTIONAL MATERIALS

Textbooks:

a. Boyd and Sheldon
b. Thompson, Primer

CLASSROOM HOURS	2

EVALUATION (P-1)

Given the necessary information and related instruction, the learner will identify 10 causes of disease. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

P-2 Describing distrubances in blood flow and body fluids

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the disturbances in flood flow and body fluids.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. SF-1 Describing the general body flow and structure units
b. SF-5 Describing the transportation of materials through the body

Provide Information On:

a. Types and causes of edema
b. Hemorrhage
c. Principle sites and causes of thrombosis
d. Effects of embalism
e. Causes and effect of ischemia
f. Hypertension
g. Water balance
h. Causes of shock
i. Radiographic applications

INSTRUCTIONAL MATERIALS

Textbooks:

a. Boyd and Sheldon
b. Thompson, Primer

CLASSROOM HOURS 2

EVALUATION (P-2)

Given the necessary information and related instruction, the learner will describe seven (7) conditions involving disturbances in blood flow and body fluids. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

P-3 Describing inflammation, infection and repair of tissue

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the symptoms of inflammation and infection, and the process of tissue repair.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. SF-1 Describing the general body plan and structural units
b. SF-5 Describing the transportation of materials through the body

Provide Information On:

a. Causes of inflammation
b. Inflammatory response
c. Types of bacteria
d. Methods of spread of bacterial and viral infections
e. Common bacterial and viral infections
f. Principles of treatment
g. Tissue repair

INSTRUCTIONAL MATERIALS

Textbooks:

Boyd and Sheldon

CLASSROOM HOURS 4

EVALUATION (P-3)

Given the necessary information and related instruction, the learner will describe the symptoms of inflammation and infection, and the process of tissue repair. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

P-4 Defining and listing symptoms of degenerative diseases

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, list and define the major symptoms of degenerative diseases.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. SF-1 Describing the general body plan and structure units
b. SF-2 Describing the structure of and classification of bones
c. SF-4 Describing the nervous system and special senses
d. SF-5 Describing the transportation of materials through the body

Provide Information On:

a. Arteriosclerosis and atherosclerosis
b. Results of atherosclerosis
c. Senile osteoporosis
d. Paget's disease
e. Pulmonary emphysema
f. Radiographic importance of each of the above

INSTRUCTIONAL MATERIALS

Textbooks:

a. Boyd and Sheldon
b. Thompson, Primer

CLASSROOM HOURS 2

EVALUATION (P-4)

Given the necessary information and related instruction, the learner will list and define the major symptoms of degenerative diseases. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

P-5 Describing common diseases affecting the body systems

PERFORMANCE OBJECTIVE

Provided with the necessary information and related instruction, describe the common diseases affecting the body systems.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

SF-1 through SF-8

Provide Information On:

a. Diseases of the cardiovascular system
b. Diseases of the respiratory system
c. Diseases of the digestive system
d. Diseases of the biliary system
e. Diseases of the urinary system
f. Diseases of the endocrine system
g. Diseases of the central nervous system
h. Diseases of the skeletal system

INSTRUCTIONAL MATERIALS

Textbooks:

a. Boyd and Sheldon
b. Thompson, Primer

CLASSROOM HOURS 10

EVALUATION (P-5)

Given the necessary information and related instruction the learner will describe the common diseases affecting the body systems. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

1.01 Describing the history of radiology and radiography

PERFORMANCE OBJECTIVE

Provided information, and related instructor, describe the history of radiology and radiography.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Major landmarks and contributors to modern medicines
b. Individuals responsible for discovery of X-rays
c. Development of modern radiographic equipment
d. Medical specialties
e. Health care delivery
f. Professional organizations
g. Professional development

INSTRUCTIONAL MATERIALS

Textbooks:

Watson

CLASSROOM HOURS 2 hr. 30 min.

EVALUATION (1.01)

Given the necessary information and related instruction, the learner will describe the development of radiology and radiography. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

1.02 Describing Program Guidelines and organization

PERFORMANCE OBJECTIVE

Provided information and related instruction, describe the organization and guidelines of the radiography program.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Organization of the program
b. Directors and instructors
c. Clinical affiliates
d. Departmental and hospital rules and regulations
e. Organizational structure of X-ray department
f. School rules and regulations

INSTRUCTIONAL MATERIALS

CLASSROOM HOURS 2 hr. 30 min.

EVALUATION (1.02)

Given information and related instruction, the learner will describe the organization and guidelines of the radiography program. Evaluation will be by written examination and based on criteria specified by the instructor.

TASK

1.03 Demonstrating a professional attitude in dealing with patients and co-workers

PERFORMANCE OBJECTIVE

Provided with simulated situations involving professional ethics and local program guidelines, resolve the situations.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Definitions of moral, legal, and professional ethics
b. Confidential information
c. Interpersonal relationships
    1. Patients
    2. Co-workers
d. Medicolegal considerations
e. Professional guidelines

INSTRUCTIONAL MATERIALS

Textbooks:

a. Watson
b. Torres and Moore

CLASSROOM HOURS 5

EVALUATION (1.03)

Given several situations involving professional ethics, the learner will resolve the situations according to the established code of ethics.

TASK

2.01 Index and file radiographs

PERFORMANCE OBJECTIVE

Provided with radiographs and film folders, index and file them according to the established filing system

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Local department's filing system
b. Required identifying information
c. Filing systems commonly used
d. Steps in procedure

Demonstration of Tasks:

By instructor or office staff

Laboratory Practice:

Have learner index and file several radiographs

Clinical Application:

Have learner index and file radiographs during orientation rotation

INSTRUCTIONAL MATERIALS

Equipment:

a. Radiographs
b. Film folders

CLASSROOM HOURS 1

EVALUATION (2.01)

Given radiographs and film folders, the learner will index and file the radiographs in the patients' folders according to the established filing system with 100% accuracy.

TASK

2.02 File records such as correspondence, publications, regulations and policies.

PERFORMANCE OBJECTIVE

Provided with a variety of items to be filed, file the items in the appropriate files according to the filing system.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Filing systems commonly used
b. Local departments filing system
c. Steps in procedure

Demonstration of Tasks:

By instructor or office staff ,

Laboratory Practice:

Have the learner file a variety of appropriate items.

Clinical Application:

Have learner file various items during orientation rotation.

INSTRUCTIONAL MATERIALS

Equipment:

a. File folders
b. Various items to be filed

CLASSROOM HOURS

30 min.

EVALUATION (2.02)

Given items to be filed, the learner will file the items in the appropriate files according to the established system. All items must be filed without error.

TASK

2.03 Forward radiographic reports to physicians

PERFORMANCE OBJECTIVE

Provided with radiographic reports, forward all reports to the appropriate places.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Persons receiving copies of reports
   1. In-patients
   2. Out-patients
b. Color-coding of copies
c. Forms used to forward reports
d. Steps of procedure

Demonstration of Tasks:

By instructor or office staff

Laboratory Practice:

Have learner prepare several radiographs for forwarding.

Clinical Application:

Have learner distribute radiographic reports during orientation rotation.

INSTRUCTIONAL MATERIALS

Equipment:

Forwarding forms

CLASSROOM HOURS 30 min.

EVALUATION (2.03)

Given radiographic reports, the learner will forward all reports to the appropriate places. All copies must be distributed without error.

TASK

2.04 Process loans of radiographs

PERFORMANCE OBJECTIVE

Provided with a request for a loan of radiographs, process the radiographs for loan.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Who has access to radiographs
b. Information to be recorded on load folders
c. Procedure for loaning radiographs
d. Importance of accuracy

Demonstration of Tasks:

By instructor or office staff

Laboratory Practice:

Have learner process several requests for a loan of radiographs.

Clinical Application:

Have learner process radiographs for loan during orientation rotation.

INSTRUCTIONAL MATERIALS

Equipment:

a. Loan folders
b. Radiographs

CLASSROOM HOURS

30 min.

EVALUATION (2.04)

Given a request for a loan of radiographs, the learner will process the radiographs for loan. All information must be recorded on the mailing folder and the patient's permanent folder without error.

TASK

2.05 Maintain radiology work record for statistical purposes

PERFORMANCE OBJECTIVE

Provided with appropriate log books and records, record radiology work on daily, monthly, and yearly report forms.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Clinical data to be recorded
b. Appropriate forms to be used
c. Need for accurate records

Demonstration of Tasks:

By instructor or office staff

Laboratory Practice:

Have learner record radiology work for specified period of time.

Clinical Application:

Have learner maintain statistical records during orientation rotation.

INSTRUCTIONAL MATERIALS

Equipment:

a. Log book
b. Daily report forms
c. Monthly report forms
d. Yearly report forms

CLASSROOM HOURS 1

EVALUATION (2.05)

Given appropriate log books and records, the learner will record radiology work on daily, monthly, and yearly report forms. Information must be legible and recorded on the forms without error.

TASK

2.06 Prepare supply requests

PERFORMANCE OBJECTIVE

Provided with a list of supplies and/or equipment and the necessary form(s), prepare a requisition for their purchase.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Identifying the source or supplies
b. Information needed on requisition
c. Required administrative approval

Demonstration of Tasks:

By instructor or department supervisor

Laboratory Practice:

Have learner prepare several supply requests for a variety of supplies.

Clinical Application:

Have learner prepare a supply/equipment requisition.

INSTRUCTIONAL MATERIALS

Equipment:

a. Supply catalogs
b. Requisition forms

CLASSROOM HOURS

30 min.

EVALUATION (2.06)

Given a list of supplies and/or equipment, the learner will prepare a requisition for their purchase. The requisition must be accurate as to the appropriate source, quantity, and item(s) description.

TASK

2.07 Prepare charges and credits for patient billing

PERFORMANCE OBJECTIVE

Provided with a list of services rendered a patient and a list of charges, fill out a charge (or credit) slip for each service provided.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Patient identifying data
b. Filling out the charge or credit slip
c. Routing the slips to the proper department

Demonstration of Task:

By instructor or office staff

Laboratory Practice:

Have learner fill out several charge and credit slips

Clinical Application:

Have learner fill out a charge slip

INSTRUCTIONAL MATERIALS

Equipment:

a. Charge slips
b. List of charges
c. Credit slips

CLASSROOM HOURS

30 min.

EVALUATION (2.07)

Given a list of services rendered a patient and a list of charges, the learner will fill out a charge slip for each service provided.

TASK

2.08 Prepare safety and accident reports

PERFORMANCE OBJECTIVE

Provided with a description of the situation in which an accident/incident occurred and the necessary form(s), prepare an accident report.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Types of accidents/ incident which must be reported
b. Information needed for the report
c. Signature(s) needed on the report
d. Importance of details and accuracy

Demonstration of Tasks:

By instructor

Laboratory Practice:

Have learners prepare several accident reports for simulated or real situations.

Clinical Application:

Have learner prepare an accident report for a hypothetical situation.

INSTRUCTIONAL MATERIALS

Textbooks:

Wood and Rambo

Equipment:

Report forms

CLASSROOM HOURS 30 min.

EVALUATION (2.08)

Given a description of a situation in which an accident/ incident occurred and the necessary form, the learner will prepare an accident report. All required information must be included in the report and the report(s) must be dated and signed.

TASK

2.09 Check for signed permit forms

PERFORMANCE OBJECTIVE

Provided with a radiographic examination procedure which requires a permit form, check the patient's chart for a signed permit form.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Examinations requiring signed perfmits
b. Probable location of signed permits
c. Information required on a permit form

Demonstration of Tasks:

By instructor

Laboratory Practice:

Have learner check several charts with complete and incomplete permit forms.

Clinical Application:

Have learner check a patient's chart for signed permit form.

INSTRUCTIONAL MATERIALS

Textbooks:

Wood and Rambo

Equipment:

a. Patient chart
b. Permit form

CLASSROOM HOURS 30 min.

EVALUATION (2.09)

Given a radiologic examination procedure which requires a permit form, the learner will check the patient's chart for a signed permit form(s). The form(s) must be signed by the patient and witnessed.

TASK

2.10 Interview and record patient's medical history

PERFORMANCE OBJECTIVE

Provided with a patient and the necessary form, interview the patient and record his/her medical history.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. The type of information needed
b. The method of recording the information
c. The need for confidentiality

Laboratory Practice:

Have the learner interview a patient and record the medical history. (Another student may simulate the patient).

INSTRUCTIONAL MATERIALS

Textbooks:

a. Watson, 4th ed.
b. Wood and Rambo

CLASSROOM HOURS 30 min.

EVALUATION (2.10)

Given a patient and the necessary form(s), the learner will interview the patient and record the medical history. All information must be recorded on the form(s) required by local facility without error.

TASK

3.01 Issue and collect radiation detectors such as film badges.

PERFORMANCE OBJECTIVE

Provided with film badges, distribute according to name on badge.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Precautions in handling film badges
b. Film badge services
c. Purpose of badges
d. Types of badges
e. Importance of collecting and mailing on time

Demonstration of Tasks:

By instructor or office staff

Laboratory Practice:

Have learner go through procedure of issuing and collecting badges and preparing report forms.

Clinical Application:

Have learner issue and collect film badges

INSTRUCTIONAL MATERIALS

Equipment:

a. Film badges
b. Report/mailing forms

CLASSROOM HOURS 30 min.

EVALUATION (3.01)

Given film badges, the learner will distribute according to name on badge. Badges must be issued on date on badge and exposed badges must be packaged for mailing exactly one month from date on badges.

TASK

3.02 Provide radiation protection for self, co-workers and patients

PERFORMANCE OBJECTIVE

Provided a radiographic machine, patient, and necessary equipment, provide radiation protection for self, patient, and co-workers.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Sources of radiation
b. Recommend radiation protection guides
c. Personnel monitoring
d. Effects of radiation exposure
e. Units of measurement
f. Basic protection methods

Provide A/V On:

Radiation protection

Demonstration of Tasks:

By instructor or room supervisor

Clinical Application:

Have the learner demonstrate radiation protection practices in the X-ray department.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Frankel
b. Selman, 6th ed.
c. Merrill, 4th ed., Vol 1
d. NCRP Report No. 33

Equipment:

a. Film badges
b. Lead gloves
c. Lead aprons
d. Lead shields

A/Vs:

Multi-Media
a. "Radiography - Radiation Protection"
b. "Radiological Health"

CLASSROOM HOURS 11

EVALUATION (3.02)

Given an X-ray machine, patient, and the necessary equipment, the learner will provide radiation protection for self, patient and co-workers. Protection must meed the regulations in NCRP Repoert # 33.

TASK

3.03 Evaluating radiation monitoring reports

PERFORMANCE OBJECTIVE

Provided with radiation monitoring reports, evaluate for exposure which are in accord with the recommended guides and those which are not.

INSTRUCTIONAL ACTIVITIES

Prerequisite Tasks:

Pro-1 Listing the quantities and units of measurement of radiation

Provide Information On:

a. Maximum permissible dose for whole body and tissues
b. State and local regulations regarding MPD
c. Occupational exposure
   1. During pregnancy
   2. Students under 18
   3. Special cases
d. Medical exposure
e. Rationale for MPD and differences between occupational MPD and MPD for general public
f. Purpose for monitoring devices
g. Types, characteristics, uses, advantages and disadvantages of each type
h. Monitoring reports

Laboratory Practice:

Have the learner:

a. Evaluate radiation monitoring reports for conditions which are in accord with guidelines and those which are not.

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Frankel
b. NCRP report #33
c. Selman
d. Christensen

Equipment:

a. Monitoring devices
b. Monitoring reports

CLASSROOM HOURS 5

EVALUATION 3.03

Given radiation monitoring reports, the learner will evaluate the reports for conditions that are in accord with radiation safety guidelines and those which are not. The learner must identify all unsafe conditions.

(continued from front page)

INSTRUCTIONAL ACTIVITIES

Laboratory Practice:

b. Discuss how the reports can be helpful in evaluating work habits and radiation safety conditions.

TASK

4.01 Washing hands

PERFORMANCE OBJECTIVE

Provided handwashing facilities and the necessary supplies, wash your hands.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Definition of asepsis
b. How pathogens are spread
c. Portals of entry of pathogens
d. Body's response to disease
e. Steps of handwashing procedure
f. When procedures must be used

Provide A/V On:

Handwashing

Demonstration of Tasks:

By instructor or a peer who has mastered task

Clinical Application:

Have learner wash hands in clinical setting

INSTRUCTIONAL MATERIALS

Textbooks:

a. Hornemann
b. Lewis
c. Wood, 1972, vol. 2
d. Torres and Moore

A/Vs:

Trainex, "Medical Asepsis"

Equipment:

a. Sink with running water
b. Soap
c. Paper towels
d. Waste can
e. Lotion (optional)

CLASSROOM HOURS

1

EVALUATION (4.01)

Given handwashing facilities and the necessary equipment and supplies, the learner will correctly wash his/her hands. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Stood away from sink to avoid contacting sink with clothing.		
2. Turned on faucet correctly.		
3. Applied soap throroughly.		
4. Washed palms and backs of hands with strong friction.		
5. Washed fingers, between fingers, wrists, and lower forearms.		
6. Rinsed well. Allowed water to run from wrists to fingers.		
7. Repeated steps 3 - 6.		
8. Dried throroughly with clean towel from wrists to fingertips.		
9. Turned off water with paper towel, if applicable.		

TASK

4.02 Caring for a patient receiving IV infusion

PERFORMANCE OBJECTIVE

Provided with a patient receiving an IV infusion, physician's orders and a watch with a second hand, regulate the IV flow rate.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 1.03 Professional attitude
b. 4.01 Wash hands

Provide Information On:

a. What IV infusion is
b. Ways to insure patient's safety and comfort
c. How to assist the patient in dressing and ambulating
d. How to regulate IV flow rate

Provide A/V On:

IV therapy

Laboratory Practice:

Have learner practice calculating IV flow rate

Clinical Application:

Have learner assist a patient who is receiving an IV infusion

INSTRUCTIONAL MATERIALS

Textbooks:

a. Hornemann
b. Lewis
c. Torres and Moore
d. Watson

A/Vs:

Trainex, "Care of Your Patient Receiving Intravenous Therapy"

Equipment:

a. Practice IV set
b. Mannequin
c. Watch with second hand

CLASSROOM HOURS 1

EVALUATION (4.02)

Given a patient in which an IV infusion is in progress, physician's orders and a watch with a second hand, the learner will regulate the IV infusion. The infusion must be regulated to the prescribed number of drops per minute.

TASK

4.03 Transporting patients in a wheelchair

PERFORMANCE OBJECTIVE

Provided a patient and a wheelchair, assist a patient from the bed into the wheelchair and transport the patient.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 1.03 Professional attitude
b. 4.01 Wash hands

Provide Information On:

a. Assisting to dangle and ambulate
b. How to operate wheelchair
c. Safety precautions
d. Steps of procedure
e. Body mechanics

Provide A/V On:

Use of wheelchair

Demonstration of Tasks:

By instructor or peer who has mastered the task

Laboratory Practice:

Have learner practice operating wheelchair and with a classmate as the patient, practice the task

Clinical Application:

Have learner assist a patient into a wheelchair and transport the patient to a specified destination

INSTRUCTIONAL MATERIALS

Textbooks:

a. Hornemann
b. Wood and Rambo
c. Torres and Moore
d. Watson

A/Vs:

Trainex "Transfer Activities and Ambulation"

Equipment:

a. Wheelchair
b. Patient robe
c. Patient slippers
d. Footstool
e. Blanket (optional)

CLASSROOM HOURS 1

EVALUATION (4.03)

Given a patient and a wheelchair, the learner will assist the patient in moving to and from the wheelchair in a safe manner consistent with the patient's condition.

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Identified patient.		
2. Checked to be sure tubes, drainage bottles, catheters, etc. were secure.		
3. Explained procedure.		
4. Transported patient along right side of hall.		
5. Moved patient through door in proper manner.		
6. Used elevator in proper manner.		
7. Made turns carefully and smoothly.		
8. Set hand brakes at destination.		

TASK

4.04 Transporting a patient on a stretcher

PERFORMANCE OBJECTIVE

Provided a bed patient, stretcher, co-workers and the necessary equipment, transfer the patient from the bed to stretcher and transport the patient.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 1.03 Professional attitude
b. 4.01 Wash hands

Provide Information On:

a. Types of transfer to stretcher
b. Safety procedures
c. Steps of procedure
d. Body mechanics

Provide A/V On:

Moving patient from bed to stretcher

Demonstration of Tasks:

Moving patient from bed to stretcher

Laboratory Practice:

Have student practice the task using classmates as the co-workers and the patient

Clinical Application:

Have learner transfer a patient from the bed to a stretcher and transport the patient to a specified destination

INSTRUCTIONAL MATERIALS

Textbooks:

a. Hornemann
b. Lewis
c. Torres and Moore
d. Watson

A/Vs:

Trainex, "Lifting and Moving Patients"

Equipment:

a. Stretcher
b. Draw sheet
c. Co-workers

CLASSROOM HOURS

1

EVALUATION (4.04)

Given a patient to be moved on a stretcher, the learner will transport the patient. All items on the checklist must be rated "acceptable".

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Identified patient and checked for tubes, drainage bottles, catheters, etc.		
2. Explained procedure.		
3. Made sure patient secured to stretcher.		
4. Transported patient with stretcher properly oriented.		
5. Protected patient's head.		
6. Moved patient through door in proper manner.		
7. Used elevator in proper manner.		
8. Approached corners properly		
9. Turned corners properly.		
10. Locked wheels at destination.		

TASK

4.05 Turning patients in bed

PERFORMANCE OBJECTIVE

Provided with a patient who is unable to turn, position the patient in the Sims, prone and/or supine positions.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 1.03 Professional attitude
b. 4.01 Wash hands

Provide Information On:

a. Body mechanic
b. Types of patients who need special positioning
c. Definition of log-rolling
d. Why patients are log rolled
e. Types of patients requiring log rolling
f. Equipment used for procedure
g. Procedures for positioning patient

Provide A/V On:

Positioning a dependent patient

Demonstration of Tasks:

By instructor or peer who has mastered the task

Laboratory Practice:

Have learner practice the task using a classmate as the patient

Clinical Application:

Have learner position a dependent patient in bed

INSTRUCTIONAL MATERIALS

Textbooks:

a. Broadwell and Milutinovic
b. Lewis
c. Torres and Moore
d. Watson

A/Vs:

Trainex, "Positioning to Prevent Complications"

Equipment:

a. Foot board
b. Trochanter rolls and/or sandbags
c. Pillows
d. Towels/palm grips

CLASSROOM HOURS 2

EVALUATION (4.05)

Given a patient who is unable to turn the learner will position the patient in the Sims', prone and/or supine positions. The patient's body alignment must be maintained and supported.

TASK

4.06 Taking blood pressure

PERFORMANCE OBJECTIVE

Provided with a patient and the necessary equipment take a patient's blood pressure.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Definition of blood pressure
b. Normal ranges of blood pressure
c. Equipment used
d. Steps of procedure

Provide A/V On:

Taking blood pressure

Demonstration of Tasks:

By instructor or peer who has mastered the task

Laboratory Practice:

Have learner take the blood pressure of classmates with the instructor monitoring with a teaching stethoscope.

Clinical Application:

Have learner take a patient's blood pressure

INSTRUCTIONAL MATERIALS

Textbooks:

a. Hornemann
b. Lewis
c. Wood
d. Torres and Moore

A/Vs:

Trainex "Blood Pressure"

Equipment:

a. Sphygmomanometer
b. Stethoscope
c. Teaching stethoscope
d. Pen and pad

CLASSROOM HOURS 2

EVALUATION (4.06)

Given a patient and the necessary equipment the learner will measure and record the patient's blood pressure. Both the systolic and diastolic recorded readings must be accurate to within ± 4 points.

TASK

4.07 Taking pulse and respirations

PERFORMANCE OBJECTIVE

Provided a patient and the necessary equipment, determine the patient's pulse and respiration rate.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Anatomy of heart, vessels and respiratory system
b. Definition of pulse rate, strength and rhythm and respiration
c. Normal pulse and respiration rates for adults and children
d. Types of irregularities (pulse and respiration)
e. Equipment used
f. Steps of procedure

Provide A/V On:

Taking pulse and respiration

Demonstration of Tasks:

By instructor

Laboratory Practice:

Have learner practice taking pulse and respiration of classmates

Clinical Application:

Have learner take a patient's pulse and respiration

INSTRUCTIONAL MATERIALS

Textbooks:

a. Hornemann
b. Lewis
c. Wood,
d. Torres and Moore

A/Vs:

Trainex "Temperature, Pulse and Respiration"

Equipment:

a. Watch with second hand
b. Pen and pad

CLASSROOM HOURS

1

EVALUATION (4.07)

Given a patient and a watch with a second hand, the learner will determine the patient's pulse and respiratory rate. Pulse rate determination must be accurate to within ± 4; respiratory rate accurate to within ± 2.

TASK

5.01 Administering oxygen

PERFORMANCE OBJECTIVE

Provided with a patient, physician's orders, and emergency cart, administer oxygen to the patient.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Why oxygen is given
b. How oxygen is administered
c. Safety factors
d. Sets of procedures

Provide A/V On:

Oxygen administration

Demonstration of Tasks:

Oxygen administration

Laboratory Practice:

Have learner practice the steps of the procedure, using a mannequin as the patient

Clinical Application:

Have learner administer oxygen to a patient

INSTRUCTIONAL MATERIALS

Textbooks:

a. Hownemann
b. Lewis
c. Torres and Moore
d. Watson

A/Vs:

Trainex "Oxygen Administration"

Equipment:

a. Oxygen mask
b. Oxygen nasal cannula and/or catheter
c. Oxygen tent
d. Flowmeter
e. Oxygen tent and regulator
f. "No Smoking" sign
g. Mannikin

CLASSROOM HOURS 1

EVALUATION 5.01

Given a patient, physician's orders, and emergency cart, the learner will administer oxygen to the patient. The oxygen liter flow and method of administration must be the same as those designated by the physician's orders.

TASK

5.02 Providing first aid for a victim of shock

PERFORMANCE OBJECTIVE

Provided with a situation simulating a patient in shock, apply steps to prevent or relieve shock.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 4.06 Take blood pressure
b. 4.07 Take pulse and respiration

Provide Information On:

a. Causes of shock
b. Signs of shock
c. Purpose of treatment

Demonstration of Tasks:

By instructor

Laboratory Practice:

Have learner practice steps in recognizing and treating shock with another student as victim

INSTRUCTIONAL MATERIALS

Textbooks:

a. Torres and Moore
b. Watson
c. Wood and Rambo

Equipment:

a. Blanket
b. BP cuff
c. Stethoscope
d. Watch with second hand

CLASSROOM HOURS 1

EVALUATION (5.02)

Given a situation simulating a patient in shock, the learner will apply steps to prevent or relieve shock. All checklist items must be rated "acceptable".

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Assured open airway.		
2. Summoned aid.		
3. Reassured patient.		
4. Covered patient.		
5. Correctly positioned patient.		
7. Handled patient in a quiet and controlled manner.		

TASK

5.03 Providing first aid for convulsing patient

PERFORMANCE OBJECTIVE

Provided with a situation simulating a patient with convulsions, provide first aid.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Conditions that cause convulsions
b. Types of seizures
c. Signs and symptoms of seizures

Demonstration of Tasks:

By instructor

Laboratory Practice:

Have student practice the task using classmates as the patient.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Wood and Rambo
b. Torres and Moore
c. Watson

CLASSROOM HOURS 1

EVALUATION (5.03)

Given a situation simulating a patient with convulsions, the learner will provide first aid. The patient must be prevented from seriously injuring self without forceful restraint.

TASK

5.04 Providing assistance for a vomiting patient

PERFORMANCE OBJECTIVE

Given a situation simulating a patient who is vomiting, provide assistance.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Using the suction apparatus
b. Radiographic examinations that might cause nausea and vomiting

Demonstration of Tasks:

By instructor

Laboratory Practice:

Have the student practice the task using classmate as the patient

INSTRUCTIONAL MATERIALS

Textbooks:

a. Torres and Moore
b. Watson

Equipment:

a. Emesis basin
b. Suction machine and tubing
c. Washcloths or towels

CLASSROOM HOURS

30 min.

EVALUATION (5.04)

Given a situation simulating a patient who is vomiting the learner will provide assistance. All checklist items must be rated "acceptable".

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Provided an emesis basin.		
2. Provided a cold compress.		
3. Instructed patient to breathe through mouth if not actively vomiting.		
4. Correctly positioned patient who was lying down.		
5. Suctioned patient correctly.		

TASK

5.05 Providing first aid for a patient who has fainted

PERFORMANCE OBJECTIVE

Provided with a situation simulating a patient who has fainted or is on the verge of fainting, initiate the necessary steps to revive the patient.

INSTRUCTIONAL ACTIVITIES

Prerequisite Tasks:

a. 4.06 Take blood pressure
b. 4.07 Take pulse and respirations

Provide Information On:

a. Cause of fainting
b. Signs of fainting
c. Treatment of fainting

Demonstration of Tasks:

By instructor

Laboratory Practice:

Have learner practice the steps in reviving a person who has fainted or is about to faint using another student as the patient

INSTRUCTIONAL MATERIALS

Textbooks:

a. Torres and Moore
b. Watson

Equipment:

a. Wash cloths
b. BP cuffs
c. Stethoscope
d. Watch with second hand

CLASSROOM HOURS 30 min.

EVALUATION (5.05)

Given a situation simulating a patient who has fainted or is about to faint, the learner will take the steps necessary to revive the patient. All checklist items must be rated "acceptable".

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Protected patient.		
2. Correctly positioned patient.		
3. Bathed patient's face with cold towel.		
4. Stimulated patient.		
5. Checked color and respiration before releasing patient.		

TASK

5.06 Giving cardiopulmonary resuscitation to a patient with cardiac arrest

PERFORMANCE OBJECTIVE

Provided with a situation simulating a patient with cardiac arrest and an assistant, perform external cardiac compressions on an adult using single rescuer and two rescuers methods.

INSTRUCTIONAL ACTIVITIES

Prerequisite Tasks:

4.07 Take pulse and respiration

Provide Information On:

a. Relation of cardiac and pulmonary function
b. Definition of cardiac arrest
c. Causes of cardiac arrest
d. Signs of cardiac arrest
e. Purpose of CPR
f. Steps of procedure

Provide A/V On:

CPR

Demonstration of Tasks:

By a licensed instructor

Laboratory Practice:

Have learner practice the steps of procedure on a mannikin (adult and infant)

Clinical Application: (optional)

Have learner certified by completing an authorized course

INSTRUCTIONAL MATERIALS

Textbooks:

a. Georgia Heart Association Printouts
b. Red Cross Manual

A/Vs:

Provided by resource person

Equipment:

Resusi-mannikin (adult and infant)

CLASSROOM HOURS 6

EVALUATION (5.06)

Given a situation simulating a patient with cardiac arrest and an assistant, perform external cardiac compressions on an adult using single rescuer and two rescuers methods. Patient must be correctly positioned. Hands must be correctly positioned and the compression ventilation ratio must be 15:2 for single rescuer and 5:1 for two rescuers.

TASK

5.07 Providing first aid for external hemmorrhage

PERFORMANCE OBJECTIVE

Provided a situation simulating a patient with severe external bleeding and the necessary supplies control the external hemorrhage.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Types of external bleeding
b. Methods of controlling hemorrhage
c. Results of uncontrolled bleeding
d. Treatment of shock

Provide A/V On:

Hemorrhage control

Demonstration of Tasks:

Hemorrhage control

Laboratory Practice:

Have learner practice the three methods of controlling external hemorrhage using a mannikin as the patient or a classmate

INSTRUCTIONAL MATERIALS

Textbooks:

a. Grant and Murray
b. Thompson and Rosdahl
c. Watson

A/Vs:

Trainex "Shock and Hemorrhage"

Equipment:

a. Gauze strips
b. Gauze pads
c. Tourniquet devices
d. Blanket
e. BP cuff
f. Stethoscope
g. Watch with second hand
h. Mannikin

CLASSROOM HOURS

1

EVALUATION (5.07)

Given a simulated situation of a patient experiencing severe external bleeding, the learner will control the bleeding. The bleeding must be controlled according to source of bleeding and treatment for shock must be initiated.

TASK

5.08 Maintain emergency tray

PERFORMANCE OBJECTIVE

Provided with an emergency tray and inventory list, identify and correct any deficiencies.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Purpose of drugs found on the emergency tray
b. Necessity for keeping emergency tray well-stocked

Laboratory Practice:

Have the learner practice maintaining an emergency tray

Clinical Application:

Have the learner check the emergency tray and restock

INSTRUCTIONAL MATERIALS

Textbooks:

Torres and Moore

Equipment:

a. Emergency tray
b. Inventory list

CLASSROOM HOURS

1

EVALUATION (5.08)

Given an emergancy tray and inventory list, the learner will identify and correct any deficiencies. All supplies must be sterile and current.

TASK

6.01 Preparing the patient for radiographic examination

PERFORMANCE OBJECTIVE

Provided with a patient, prepare the patient for a radiographic examination.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Clothes and other objects that need to be removed
b. Dressing the patient

Laboratory Practice:

a. Have the learner prepare a patient for various radiographic examinations (another learner may simulate the patient)
b. Have the learner view radiographs of improperly dressed patients

Clinical Application:

Have learner prepare a patient for a radiographic examination

INSTRUCTIONAL MATERIALS

Textbooks:

Torres and Moore

Equipment:

a. Patient gowns
b. Radiographs made with foreign objects (clothing and jewelry)

CLASSROOM HOURS	30 min.

EVALUATION (6.01)

Given a patient and patient gown, the learner will prepare the patient for radiographic examination. All radiopaque objects must be removed and the patient must be properly gowned.

TASK

6.02 Handling a patient with a spine or skull injury

PERFORMANCE OBJECTIVE

Provided with a patient with a spine or skull injury, handle the patient so that further injury is prevented.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 4.04 Transport a patient on a stretcher
b. 4.06 Take blood pressure
c. 4.07 Take pulse and respiration

Provide Information On:

a. Immobilization devices
b. Complications of spine and skull injuries
c. Precautions in handling patients with spine and skull injuries
d. The need to observe patient closely

Laboratory Practice:

Have the learner practice the task using a classmate as the patient

INSTRUCTIONAL MATERIALS

Textbooks:

a. Torres and Moore
b. Watson

Equipment:

a. Stretcher
b. Immobilization devices

CLASSROOM HOURS	1

EVALUATION (6.02)

Given a patient with a spine or skull injury, the learner will handle the patient so that further injury is prevented. The patient must be correctly prepared for radiographs without being moved.

TASK

6.03 Handling a patient with a fractured hip or extremities

PERFORMANCE OBJECTIVE

Provided with a patient with a simulated fracture of hip or extremities, prepare the patient for radiographic examination.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 4.03 Transport a patient in a wheelchair
b. 4.04 Transport a patient on a stretcher
c. 4.05 Turning patients in bed

Provide Information On:

a. Types of fractures
b. Precautions in handling patients with fractures
c. Body mechanics

Demonstration of Tasks:

By instructor

Laboratory Practice:

Have the learner practice moving a student simulating a fractured hip or extremities.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Torres and Moore
b. Watson

CLASSROOM HOURS 1

EVALUATION (6.03)

Given a patient with a simulated fracture of hip or extremities, the learner will prepare the patient for radiologic examination. The joints above and below the fracture must be supported and the patient's body or extremities must be moved as a unit.

TASK

6.04 Restraining pediatric patients for radiographic examinations

PERFORMANCE OBJECTIVE

Provided with a pediatric patient, physician's orders, and supplies, restrain the child for radiographic examination.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

6.01 Prepare the patient for radiographic examination

Provide Information On:

a. Types of restraints
b. Necessity for immobilization
c. Precautions when restraining patients
d. Communicating with the pediatric patient and parents

Demonstration of Tasks:

By instructor on methods of immobilization

Laboratory Practice:

Have learner practice the procedure using a mannikin as the patient

Clinical Application:

Have learner restrain a child for radiographic examination

INSTRUCTIONAL MATERIALS

Textbooks:

a. Torres and Moore
b. Merrill's, 4th ed., vol. 3

Equipment:

a. Mannikin
b. Sheets
c. Commercial restraints

CLASSROOM HOURS

1

EVALUATION (6.04)

Given a pediatric patient, a physician's orders and the necessary supplies, the learner will restrain the patient for a radiographic examination so that there is no motion on the radiographs.

TASK

6.05 Administering contrast media rectally/via stoma

PERFORMANCE OBJECTIVE

Provided a patient, physician's orders, and the necessary equipment administer contrast media rectally.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Purpose of enema
b. Types of enemas
c. Equipment used
d. Safety factors
e. Steps of procedure
f. The colostomy patient

Provide Information On:

Contrast media

Demonstration of Tasks:

Administering contrast media rectally

Laboratory Practice:

Have learner practice administering contrast media using a mannikin as the patient

Clinical Application:

Have learner administer contrast media to a patient

INSTRUCTIONAL MATERIALS

Instructional Units:

HOS 16.01 Give an enema

Textbooks:

a. Hornemann
b. Lewis
c. Torres and Moore
d. Watson
e. Merrill's, 4th ed., vol 3

A/Vs:

Multi-Media "Radiography, Contrast Media"

Equipment:

Enema tray containing:
a. Disposable enema bag
b. Tubing with stopcock
c. Rectal tube
d. Lubricant
e. Barium solution
f. Bedpan and cover
g. Linen savers
h. Mannikin
i. Colostomy tube

CLASSROOM HOURS

1

EVALUATION (6.05)

Given a patient, physician's orders, and the necessary equipment and supplies, administer contrast media rectally. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

	ACTIVITY	RATING	
		Acceptable	Unacceptable
1.	Informed patient of procedure.		
2.	Afforded patient privacy.		
3.	Prepared correct type, temperature, and amount of material.		
4.	Hung bag at correct height.		
5.	Expelled air from tubing.		
6.	Correctly positioned patient.		
7.	Lubricated tip of enema tube.		
8.	Inserted rectal tube slowly and gently to the appropriate depth.		
9.	Assisted patient and provided for patient's comfort and safety.		
10.	Washed hands.		

TASK

6.06 Administering contrast media orally

PERFORMANCE OBJECTIVE

Provided with a patient and physician's orders, set up and administer oral contrast media.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

4.01 Wash hands

Provide Information On:

a. Contrast media
b. Calculating dosage
c. Administering drugs orally
d. Precautions in assisting with drug administration

Provide A/V On:

Contrast media

Demonstration of Tasks:

By instructor

Laboratory Practice:

Have the learner practice the task with another student acting as the patient

Clinical Application:

Have the learner administer oral contrast media

INSTRUCTIONAL MATERIALS

Textbooks:

a. Torres and Moore
b. Watson
c. Merrill's, 4th ed., vol. 3

A/Vs:

Multi-Media "Radiography: Contrast Media"

Equipment:

a. Contrast media
b. Medicine cup
c. Straw

CLASSROOM HOURS	1

EVALUATION (6.06)

Given a patient and physician's orders, set up and administer oral contrast media. The patient and contrast media must be positively identified. The dosage must be accurately calculated and the patient must be observed until the contrast media is swallowed.

TASK

6.07 Preparing contrast media for intravenous injection

PERFORMANCE OBJECTIVE

Provided a patient and physician's orders, prepare contrast media for intravenous injection.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 4.01 Wash hands
b. 2.04 Set up sterile field

Provide Information On:

a. Types of contrast media
b. Calculating dosage
c. Needles and syringes
d. Precautions in assisting with drug administration
e. Adverse reaction to contrast media

Provide A/V On:

a. Contrast media
b. Reactions to contrast media

Demonstration of Tasks:

By instructor

Laboratory Practice:

Have the learner practice drawing up contrast media

Clinical Application:

Have the learner prepare contrast media for IV injection

INSTRUCTIONAL MATERIALS

Textbooks:

a. Torres and Moore
b. Watson
c. Merrill's, 4th ed.,vol.3

A/Vs:

Multi-media:
a. "Radiography: Contrast Media"
b. "Radiography: Reactions to Contrast Media"

Equipment:

a. Contrast media
b. Syringes
c. Needles
d. Tourniquet

CLASSROOM HOURS 4

EVALUATION (6.07)

Provided a patient and physician's orders, the learner will prepare contrast media for intravenous injection. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Washed hands.		
2. Assembled equipment and supplies.		
3. Selected proper contrast media.		
4. Drew up proper dosage.		
5. Maintained sterility.		

TASK

7.01 Putting on and removing sterile gloves

PERFORMANCE OBJECTIVE

Provided with a pack of sterile gloves, put them on .

INSTRUCTIONAL ACTIVITIES

Prerequisites:

4.01 Washing hands

Provide Information On:

a. When sterile gloves are required
b. Procedure for donning

Provide A/V On:

Donning sterile gloves

Demonstration of Tasks:

By instructor or a peer who has mastered the task .

Laboratory Practice:

Have learner practice steps of the procedure

Clinical Application:

Have learner don sterile gloves in clinical setting

INSTRUCTIONAL MATERIALS

Textbooks:

a. Hornemann
b. Lewis
c. Powell
d. Torres and Moore

A/Vs:

Trainex "Sterile Technique and Dressing Change"

Equipment:

Package of sterile gloves

CLASSROOM HOURS 1

EVALUATION (7.01)

Given a pack of sterile gloves, the learner will put them on and remove them without contaminating gloves or self.

TASK

7.02 Putting on and removing sterile gown

PERFORMANCE OBJECTIVE

Provided with a sterile gown, put it on.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

4.01 Washing hands

Provide Information On:

a. When a sterile gown is required
b. Procedure for gowning
c. Isolation gowning

Provide A/V On:

Sterile gowning and isolation gowning

Demonstration of Tasks:

By instructor or a peer who has mastered the task

Laboratory Practice:

Have learner practice gowning

Clinical Application:

Have learner put on a sterile gown in the clinical setting

INSTRUCTIONAL MATERIALS

Textbooks:

a. Torres and Moore
b. Powell
c. Watson

A/Vs:

Trainex:
a. "Operating Room Scrubbing, Gowning and Gloving
b. "Isolation Techniques

Equipment:

Sterile gown

CLASSROOM HOURS 3

EVALUATION (7.02)

Given a sterile gown, the learner will put it on without breaking sterile technique and remove it without contaminating self.

TASK

7.03 Putting on and removing mask

PERFORMANCE OBJECTIVE

Provided with a sterile mask, put on and remove a mask.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

4.01 Washing hands

Provide Information On:

a. Purpose of mask
b. When it is required
c. Steps of procedure

Provide A/V On:

Using a mask for isolation

Demonstration of Tasks:

By instructor or a peer who has mastered the task

Laboratory Practice:

Have learner practice the procedure in laboratory

Clinical Application:

Have learner don and remove a mask for isolation purposes

INSTRUCTIONAL MATERIALS

Textbooks:

a. Lewis
b. Wood and Rambo
c. Watson
d. Torres and Moore

A/Vs:

Trainex "Isolation Techniques"

Equipment:

Mask

CLASSROOM HOURS 30 min.

EVALUATION 7.03

Given a sterile mask, the learner will put it on without breaking sterile technique and remove it without contaminating self.

TASK

7.04 Setting up a sterile field

PERFORMANCE OBJECTIVE

Provided with an examination procedure and sterile equipment and supplies, set up a sterile field.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 4.01 Washing hands
b. 7.01 Putting on and removing sterile gloves

Provide Information On:

a. Surgical asepsis
b. How, contamination occurs
c. Procedure for opening sterile packs
d. Procedure for using transfer forceps
e. Procedure for pouring sterile solutions
f. Procedure for setting up sterile field
g. Procedure for using gloves to transfer sterile items
h. Procedure for preparing trays for special examinations

Provide A/V On:

Sterile technique

Demonstration of Tasks:

By instructor or peer who has mastered the task

Laboratory Practice:

Have learner practice procedures in the laboratory

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Broadwell
b. Lewis
c. Wood, vol.2,
d. Torres and Moore
e. Powell

A/Vs:

Trainex "Sterile Technique and Dressing Change

Equipment:

a. Sterile package (needle, catheter, etc.)
b. Wrapped sterile tray
c. Transfer forceps
d. Sterile solution
e. Sterile towels
f. Mayo stand (optional)
g. Gloves

CLASSROOM HOURS	2

EVALUATION (7.04)

Given an examination procedure, the learner will set up a sterile field without breaking sterile technique.

INSTRUCTIONAL MATERIALS (continued)

Clinical Application:

Have learner use sterile technique in clinical setting.

TASK

7.05 Scrubbing patient's skin

PERFORMANCE OBJECTIVE

Provided with a patient, physician's orders and a prep tray, scrub patient's skin.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 4.01 Washing hands
b. 7.01 Putting on and removing sterile gloves
c. 7.04 Handling sterile equipment and supplies

Provide Information On:

a. Purpose of scrub
b. Body area scrubbed according to type of procedure
c. Steps of procedure

Provide A/V On:

Preoperative skin prep

Demonstration of Tasks:

Preoperative skin prep

Laboratory Practice:

Have learner practice the procedure using a mannikin as the patient

Clinical Application:

Have learner prepare an operative skin site

INSTRUCTIONAL MATERIALS

Textbooks:

a. Powell
b. Torres and Moore

A/Vs:

Trainex "Preoperative Skin Preparation"

Equipment:

a. Linen savers
b. Basin of warm water
c. Soap solution
d. Antiseptic solution
e. Sterile sponges
f. Sterile drapes
g. Sterile gloves
h. Mannikin

CLASSROOM HOURS	1

EVALUATION (7.05)

Given a patient, physician's orders and a prep tray, the learner will prepare patient's skin. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Provided for patient's privacy.		
2. Washed hands.		
3. Put on gloves.		
4. Used correct scrubbing procedure.		
5. Draped patient.		

TASK

7.06 Making radiographs in the isolation unit

PERFORMANCE OBJECTIVE

Provided with a patient in an isolation unit and the necessary supplies and equipment, make specified radiographs.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 4.01 Washing hands
b. 7.01 Putting on and removing sterile gloves
c. 7.02 Putting on and removing sterile gown
d. 7.03 Putting on and removing sterile mask
e. 8.12 Making radiographs using mobile x-ray units

Provide Information On:

a. Isolation techniques
b. Communicable diseases
c. Methods of spread of infection
d. Purpose of isolation
e. Purpose of mask, gown, and gloves
f. Donning mask, gown and gloves for isolation
g. Procedure for maintaining isolation technique while making radiographs

Provide A/V On:

Isolation technique

Demonstration of Tasks:

By instructor

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Torres and Moore
b. Watson

A/Vs:

Trainex "Isolation Techniques"

Equipment:

a. Mobile x-ray machine
b. Masks
c. Gowns
d. Cassettes
e. Cloth or plastic covers for cassettes
f. Gloves
g. Disinfectant

CLASSROOM HOURS 2

EVALUATION (7.06)

Given a patient in the isolation unit and the necessary supplies and equipment, make radiographs without contaminating self or equipment.

INSTRUCTIONAL ACTIVITIES (continued)

Laboratory Practice:

Have learner practice procedure with another learner as the patient.

Clinical Application:

Have learner make radiographs in the isolation unit.

TASK

8.01 Positioning the patient in basic positions

PERFORMANCE OBJECTIVE

Provided with a simulated patient, position the patient into the routine body positions and movements

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Definitions of positioning terms and movements
b. Abbreviations for positioning terms
c. Basic rules for radiographic positioning
d. Positioning patients with injuries (head, spine, extremities)

Provide A/Vs On:

Positioning terminology

Demonstration by:

Instructor

Laboratory Practice:

Have the learner demonstrate on himself or another person each body position and movement

Clinical Application:

Have the learner position patients in the X-ray department

INSTRUCTIONAL MATERIALS

Textbooks:

a. Bontrager
b. Merrill's, vols. 1,2, and 3

A/Vs:

Multi-media, "Introduction to Terminology and Basic Principles of Radiographic Positioning"

CLASSROOM HOURS 4

EVALUATION (8.01)

Given a patient, or simulated patient, position the patient in routine body positions and movements. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
Positioned patient in LPO position		
Positioned patient in RAO position		
Positioned patient in supine position		
Positioned patient in right lateral decubitus position		
Positioned patient in prone position		
Positioned patient in Sims Position		
Demonstrated flexion of lower leg		
Demonstrated adduction of lower leg		
Demonstrated flexion of the neck		
Pronated Hand		
Demonstrated anatomical position		

(Continued on next page)

EVALUATION (8.01)

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
Extended wrist		
Abducted arm		
Flexed foot		
Demonstrated eversion of the foot		
Supinated hand		
Positioned hand for A.P. projection		
Positioned patient for P.A. chest projection		
Positioned patient for dorso-planter projection		
Positioned patient for right lateral chest		

TASK

8.02 Making radiographs of the chest

PERFORMANCE OBJECTIVE

Provided with physicians orders, a patient and the necessary equipment, make radiographs of the chest

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 1.00 Introduction to radiography
b. 4.00 Patient Care
c. 6.01 Preparing the patient for radiographic examination
d. PRE-03 Manipulating radiographic equipment
e. PRE-04 Setting controls on the control panel

Provide Information On:

a. Anatomy of the lungs
b. Anatomy of the bony thorax
c. Positioning of the patient
d. Radiation protection
e. Exposure techniques and accessories
f. Identification and Right and Left markers
g. Evaluation of the image
h. Variations for the immobile/trauma patient

Provide A/Vs On:

Anatomy and positioning of the chest

Demonstration of Task:

By instructor

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Merrill, 4th Ed., Vol. 3
b. Bontrager
c. Meschan

A/Vs:

Multi-media, "Radiographic Anatomy and Positioning of the Chest"

Equipment:

a. Phantom
b. X-ray machine
c. Cassettes and films
d. Identification markers
e. Positioning accessories
f. Chest radiographs

CLASSROOM HOURS 8

(8.02)

INSTRUCTIONAL ACTIVITIES

Laboratory Practice:

Have the learner:

a. Practice positioning for chest radiographs using another student as the patient
b. Make a chest radiograph on the phantom patient
c. Evaluate several radiographs of the chest for positioning and exposure accuracy

Clinical Application:

Have the learner make chest radiographs

EVALUATION (8.02)

a. Given a patient, a physician's orders and the necessary equipment, the learner will make chest radiographs. All checklist items must be rated "acceptable."

b. Test items are available in the Instructor's Guide for Radiographic Anatomy and Positioning by Kenneth Bontrager.

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies		
3. Positioned patient accurately for required projections.		
4. Manipulated equipment quietly and correctly.		
5. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 6. Demonstrated correct anatomical part.		
7. Aligned part, film and central ray properly.		
8. Used correct exposure factors.		
9. Identified film (Right and Left) (Patient)		

TASK

8.03 Making radiographs of the abdomen

PERFORMANCE OBJECTIVE

Provided with a patient and the necessary equipment, make routine radiographs of the abdomen.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 1.00 Introduction to radiography
b. 4.00 Patient Care
c. 6.01 Preparing the patients for radiographic examination
d. PRE-03 Manipulating radiographic equipment
e. PRE-04 Setting controls on the control panel

Provide Information On:

a. Anatomy of the abdomen
b. Bony positioning landmarks
c. Positioning of the patient
d. Acute abdomen series
e. Radiation protection
f. Exposure techniques and accessories
g. Image evaluation of abdomen

Provide A/Vs On:

Anatomy and positioning of the abdomen

Demonstration of Task:

By instructor

Laboratory Practice:

Have the learner:

a. Practice positioning for abdomen radiographs

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Merrill, 4th Ed., Vol. 3
b. Bontrager
c. Meschan

A/Vs:

Multi-media, "Radiographic Anatomy and Positioning of the Abdomen

Equipment:

a. Phantom
b. X-ray machine
c. Cassettes and films
d. Lead markers
e. Abdomen radiographs

CLASSROOM HOURS	8

(8.03)

INSTRUCTIONAL ACTIVITIES

Laboratory Practice:

b. Make abdomen radiographs on the phantom
c. Evaluate several radiographs of the abdomen for positioning accuracy and correct exposure

Clinical Application:

Have the learner make abdominal radiographs

EVALUATION (8.03)

a. Given a patient, a physician's orders and the necessary equipment, the learner will make abdomen radiographs. All checklist items must be rated "acceptable."

b. Test items are available from Bontrager, Radiographic Anatomy and Positioning.

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Positioned patient accurately for required projections.		
4. Manipulated equipment quietly and correctly.		
5. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 6. Demonstrated correct anatomical part.		
7. Aligned part, film and central ray properly.		
8. Used correct exposure factors.		
9. Identified film (Right and Left) (Patient)		

TASK

8.04 Making radiographs of the upper extremity and shoulder girdle

PERFORMANCE OBJECTIVE

Provided with a patient and the necessary equipment, make routine radiographs of the upper extremities.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 1.00 Introduction to radiography
b. 4.00 Patient Care
c. 6.01 Preparing the patient for radiographic examination
d. PRE-03 Manipulating radiographic equipment
e. PRE-04 Setting controls on the control panel

Provide Information On:

a. Anatomy of the upper extremities
b. Routine projections of the upper extremity
c. Radiation protection
d. Converting techniques for a plaster cast
e. Exposure techniques and accessories
f. Evaluating the finished radiographs
g. Variations for the immobile/trauma patient

Provide A/Vs On:

a. Anatomy and positioning of the upper extremity
b. Positioning of the trauma patient

Laboratory Practice:

Have learner:

a. Practice positioning using another student as the patient

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Merrill, 4th Ed., Vol. 1
b. Bontrager
c. Meschan

A/Vs:

Multi-media:
a. "Radiographic Anatomy and Positioning of the Upper Extremity
b. "Radiography of the Immobile Trauma Patient"

Equipment:

a. Skeleton
b. Phantom
c. X-ray machine
d. Cassettes and films
e. Lead markers
f. Lead shields
g. Radiographs of upper extremity

CLASSROOM HOURS 12

(8.04)

INSTRUCTIONAL ACTIVITIES

Laboratory Practice:

b. Make radiographs of the upper extremity on the phantom
c. Evaluate radiographs of the upper extremity for positioning accuracy and correct exposure

Clinical Application:

Have the learner make radiographs of the upper extremity

EVALUATION (8.04)

a. Given a patient and a physician's orders and the necessary equipment, the learner will make routine radiographs of the upper extremity. All checklist items must be rated "acceptable."

b. Test items are available from Bontrager, Radiographic Anatomy and Positioning.

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Positioned patient accurately for required projections.		
4. Manipulated equipment quietly and correctly.		
5. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 6. Demonstrated correct anatomical part.		
7. Aligned part, film and central ray properly.		
8. Used correct exposure factors.		
9. Identified film (Right and Left) (Patient)		

TASK

8.05 Making radiographs of the lower extremity

PERFORMANCE OBJECTIVE

Provided with a patient and the necessary equipment, make routine radiographs of the lower extremity.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 1.00 Introduction to radiography
b. 4.00 Patient Care
c. 6.01 Preparing the patient for radiographic examination
d. PRE-03 Manipulating radiographic equipment
e. PRE-04 Setting controls on the control panel

Provide Information On:

a. Anatomy of the lower extremity
b. Routine projections of the lower extremities
c. Radiation protection
d. Exposure techniques and accessories
e. Converting techniques for a plaster cast
f. Evaluating radiographs of the lower extremity
g. Variations for the immobile/trauma patient

Provide A/Vs On:

a. Anatomy and positioning of the lower extremity
b. Positioning the trauma patient for radiographs of the lower extremity

Demonstration of Task:

By instructor

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Merrill, 4th Ed., Vol. 1
b. Bontrager
c. Meschan

A/Vs:

Multi-media:
a. "Radiographic Anatomy and Positioning Toes, Foot, Ankle and Leg, Knee, Patella and Femur"
b. "Radiography of the Immobile Trauma Patient"

Equipment:

a. Skeleton
b. Radiographic phantom
c. X-ray machine
d. Cassettes and film
e. Lead markers
f. Lead shields
g. Radiographs of the lower extremity

CLASSROOM HOURS 10

(8.05)

INSTRUCTIONAL ACTIVITIES

Laboratory Practice:

Have learner:

a. Practice positioning of the lower extremity using another student as the patient
b. Make radiographs of the lower extremity on the radiographic phantom
c. Evaluate several radiographs of the lower extremity for positioning accuracy and correct exposure

Clinical Application:

Have the learner make radiographs of the lower extremity in the clinical area

EVALUATION (8.05)

a. Given a patient, a physician's orders and the necessary equipment, the learner will make routine radiographs of the lower extremity. All checklist items must be rated "acceptable."

b. Test items are available from Bontrager, Radiographic Anatomy and Positioning.

PERFORMANCE CHECKLIST

ACTIVITY	RATING Acceptable	 Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Positioned patient accurately for required projections.		
4. Manipulated equipment quietly and correctly.		
5. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 6. Demonstrated correct anatomical part.		
7. Aligned part, film and central ray properly.		
8. Used correct exposure factors.		
9. Identified film (Right and Left) (Patient)		

TASK

8.06 Making radiographs of the pelvis and hips

PERFORMANCE OBJECTIVE

Provided with a patient and the necessary equipment, make routine radiographs of the pelvis and hips.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 1.00 Introduction to radiography
b. 4.00 Patient Care
c. 6.01 Preparing the patient for radiographic examination
d. PRE-03 Manipulating radiographic equipment
e. PRE-04 Setting controls on the control panel

Provide Information On:

a. Anatomy and positioning landmarks
b. Routine projections
c. Radiation protection
d. Exposure techniques and accessories
e. Evaluating the finished radiographs
f. Variations for the immobile or trauma patient

Provide A/Vs On:

a. Anatomy and positioning of the pelvis and hips
b. Positioning of the trauma patient

Demonstration of Tasks:

By instructor

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Merrill, 4th Ed., Vol. 1
b. Bontrager
c. Meschan

A/Vs:

Multi-media:
a. "Radiographic Anatomy and Positioning Hips and Pelvis"
b. "Radiography of the Immobile Trauma Patient"

Equipment:

a. Skeleton
b. Phantom
c. X-ray
d. Cassettes and films
e. Lead markers
f. Lead shields
g. Radiographs of hip and pelvis

CLASSROOM HOURS	8

(8.06)

INSTRUCTIONAL ACTIVITIES

Laboratory Practice:

Have learner:

a. Practice positioning of the hip and pelvis using another student as the patient
b. Make radiographs of the hip and pelvis of the phantom
c. Evaluate several radiographs of the pelvis and hips for positioning accuracy and correct exposure

Clinical Application:

Have the learner make radiographs of the hips and pelvis

EVALUATION (8.06)

a. Given a patient, a physician's orders and the necessary equipment, the learner will make routine radiographs of the hip and pelvis. All checklist items must be rated "acceptable."
b. Test items are available from Bontrager, Radiographic Anatomy and Positioning.

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Positioned patient accurately for required projections.		
4. Manipulated equipment quietly and correctly.		
5. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 6. Demonstrated correct anatomical part.		
7. Aligned part, film and central ray properly.		
8. Used correct exposure factors.		
9. Identified film (Right and Left) (Patient)		

TASK

8.07 Making radiographs of the vertebral column

PERFORMANCE OBJECTIVE

Provided with a patient, physician's orders and the necessary equipment, make radiographs of the sacrum and coccyx, lumbar spine, thoracic and cervical spine.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 1.00 Introduction to radiography
b. 4.00 Patient Care
c. 6.01 Preparing the patient for radiographic examination
d. PRE-03 Manipulating radiographic equipment
e. PRE-04 Setting controls on the control panel

Provide Information On:

a. Anatomy of the vertebral column
b. Anatomical landmarks
c. Basic projections
d. Evaluation of radiographs
e. Radiation protection
f. Exposure techniques and accessories
g. Variations for the trauma patient

Provide A/Vs On:

a. Anatomy and positioning of the vertebral column
b. Positioning the trauma patient

Demonstration of Tasks:

By instructor

Laboratory Practice:

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Merrill, 4th Ed., Vol. 1
b. Bontrager
c. Meschan,

A/Vs:

Multi-media:
a. "Radiography Anatomy and Positioning of the Coccyx, Sacrum, Lumbar Spine, Cervical and Thoracic Spine"
b. "Radiography of the Immobile Trauma Patient"

Equipment:

a. Skeleton
b. Phantom patient
c. X-ray machine
d. Cassettes and films
e. Identification markers
f. Radiographs of the vertebral column

CLASSROOM HOURS

12

(8.07)

INSTRUCTIONAL ACTIVITIES

Laboratory Practice:

Have learner:

a. Practice positioning using another student as the patient
b. Make radiographs of the radiographic phantom
c. Evaluate several radiographs for positioning accuracy and correct exposure

Clinical Application:

Have the learner make radiographs of the vertebral column of a patient

EVALUATION (8.07)

a. Given a patient, physician's orders and the necessary equipment, the learner will make radiographs of the sacrum and coccyx, lumbar spine, cervical and thoracic spine. All checklist items must be rated "acceptable."

b. Test items are available from Bontrager, Radiographic Anatomy and Positioning.

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Positioned patient accurately for required projections.		
4. Manipulated equipment quietly and correctly.		
5. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 6. Demonstrated correct anatomical part.		
7. Aligned part, film and central ray properly.		
8. Used correct exposure factors.		
9. Identified film (Right and Left) (Patient)		

TASK

8.08 Making radiographs of the bony thorax

PERFORMANCE OBJECTIVE

Provided with a patient, physician's orders and the necessary equipment, make radiographs of the sternum and ribs.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 1.00 Introduction to radiography
b. 4.00 Patient Care
c. 6.01 Preparing the patient for radiographic equipment
d. PRE-03 Manipulating radiographic equipment
e. PRE-04 Setting controls on the control panel

Provide Information On:

a. Anatomy of the sternum and ribs
b. External positioning landmarks
c. Basic projections
d. Exposure techniques and accessories
e. Evaluation of radiographs
f. Variations for the trauma patient

Provide A/Vs On:

a. Anatomy and positioning of the bony thorax
b. Positioning the trauma patient

Demonstration of Tasks:

By instructor

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Merrill's, 4th Ed., Vol.1
b. Bontrager
c. Meschan

A/Vs:

Multi-media:
a. "Radiographic Anatomy and Positioning of the Bony Thorax"
b. "Radiography of the Immobile Trauma Patient"

Equipment:

a. Skeleton
b. Phantom
c. X-ray machine
d. Cassettes and films
e. Identification markers
f. Radiographs of the ribs and sternum

CLASSROOM HOURS 10

(8.08)

INSTRUCTIONAL ACTIVITIES

Laboratory Practice:

Have learner:

a. Practice positioning of the ribs and sternum using another student as the patient
b. Make radiographs of the phantom
c. Evaluate several radiographs of the ribs and sternum for positioning accuracy and correct exposure

Clinical Application:

Have learner make radiographs of the bony thorax of a patient

EVALUATION (8.08)

a. Given a patient, physician's orders and the necessary equipment, the learner will make radiographs of the sternum and ribs. All checklist items must be rated "acceptable."

b. Test items are available from Bontrager, Radiographic Anatomy and Positioning.

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Positioned patient accurately for required projections.		
4. Manipulated equipment quietly and correctly.		
5. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 6. Demonstrated correct anatomical part.		
7. Aligned part, film and central ray properly.		
8. Used correct exposure factors.		
9. Identified film (Right and Left) (Patient)		

TASK

8.09 Making radiographs of the cranial bones

PERFORMANCE OBJECTIVE

Provided with a patient, physician's orders and the necessary equipment, make radiographs of the cranial bones.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 1.00 Introduction to radiography (all)
b. 4.00 Patient care (all)
c. 6.01 Preparing the patient for radiographic examination
d. PRE-3 Manipulating radiographic equipment
e. PRE-4 Setting controls on the control panel

Provide Information On:

a. Anatomy of the cranium
b. Positioning base lines and landmarks of the skull
c. Shape classification of the cranium
d. Routine projections
e. Radiographic evaluation for correct rotation and/or tube tilt
f. Exposure techniques and accessories

Provide A/Vs On:

a. Anatomy and positioning of the cranium
b. Positioning the trauma patient

Demonstration of Tasks:

By instructor

Laboratory Practice:

Have the learner:
(continued on next page)

INSTRUCTIONAL MATERIALS

a. Merrill's, 4th Ed., Vol 2
b. Bontrager
c. Meschan

A/Vs:

Multi-Media:
a. "Radiographic Anatomy and Positioning of Cranium, Stella, Trucica and Petrous Pyramids"
b. "Radiography of the Immobile Trauma Patient"

Equipment:

a. Skull
b. Skull phantom
c. X-ray machine
d. Cassettes and films
e. Lead markers
f. Radiographs of the skull

CLASSROOM HOURS

10

(8.09)

INSTRUCTIONAL ACTIVITIES

Laboratory Practice:

a. Practice positioning the skull using a student as the patient
b. Make skull radiographs of the phantom
c. Evaluate several radiographs of the skull for positioning accuracy and correct exposure

Clinical Application:

Have the learner make radiographs of the skull on a patient in the clinical area.

EVALUATION (8.09)

a. Given a patient, a physician's order, and the necessary equipment, the learner will make radiographs of the cranium. All checklist items must be rated "acceptable."

b. Test items are available from Bontrager, Radiographic Anatomy and Positioning

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Positioned patient accurately for required projections.		
4. Manipulated equipment quietly and correctly.		
5. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 6. Demonstrated correct anatomical part.		
7. Aligned part, film and central ray properly.		
8. Used correct exposure factor		
9. Identified film (Right and Left) (Patient)		

TASK

8.10 Making radiographs of the facial bones

PERFORMANCE OBJECTIVE

Provided with a patient, a physician's orders and the necessary equipment, make radiographs of the facial bones.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

8.09 Making radiographs of the cranial bones

Provide Information On:

a. Anatomy of the facial bones
b. Positioning base lines and landmarks
c. Basic projections for the facial bones, zygomatic arches and optic foramina
d. Exposure techniques and accessories
e. Evaluation of radiographs
f. Variations for severely injured patients

Provide A/Vs On:

a. Anatomy and positioning of the facial bones
b. Positioning of the severely injured patient

Demonstration of Tasks:

By instructor

Laboratory Practice:

Have the learner:

a. Practice positioning of the facial bones using another student as the patient

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Merrill, 4th Ed., Vol. 2
b. Bontrager
c. Meschan

A/Vs:

Multi-media
a. "Radiographic Anatomy and Positioning Facial bones, Zygomatic Arches, and Optic Foramina"
b. "Radiography of the Immobile Trauma Patient"

Equipment:

a. Skull
b. Skull phantom
c. X-ray machine
d. Cassettes and films
e. Lead markers
f. Radiographs of the facial bones

CLASSROOM HOURS 6

(8.10)

INSTRUCTIONAL ACTIVITIES

Laboratory Practice:

b. Make facial bone radiographs of the skull phantom
c. Evaluate several radiographs of the facial bones for positioning accuracy and correct exposure

Clinical Application:

Have the learner make radiographs of the facial bones of patients.

EVALUATION (8.10)

a. Given a patient, a physician's orders and the necessary equipment, the learner will make radiographs of the facial bones. All checklist items must be rated "acceptable."

b. Test items are available from Bontrager, Radiographic Anatomy and Positioning

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Positioned patient accurately for required projections.		
4. Manipulated equipment quietly and correctly.		
5. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 6. Demonstrated correct anatomical part.		
7. Aligned part, film and central ray properly.		
8. Used correct exposure factors.		
9. Identified film (Right and Left) (Patient)		

TASK

8.11 Making radiographs of the mandible, sinuses and temporal bones

PERFORMANCE OBJECTIVE

Provided with a patient, physician's orders and the necessary equipment, make radiographs of the mandible, sinuses and temporal bone.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

8.09 Making radiographs of the cranial bones

Provide Information On:

a. Anatomy of the mandible, paranasal sinuses and temporal bone
b. Positioning landmarks and baselines
c. Routine projections
d. Evaluation of radiographs
e. Exposure techniques and accessories
f. Variations for the severly injured patient

Provide A/Vs On:

a. Anatomy and positioning of the mandible sinuses and temporal bones
b. Positioning the trauma patient

Demonstration of Tasks:

By instructor

Laboratory Practice:

Have the learner:

a. Practice positioning using another student as the patient

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Merrill, 4th Ed., Vol. I
b. Bontrager
c. Meschan

A/Vs:

Multi-media
a. "Radiographic Anatomy and Positioning of the Mandible, Sinuses and Temporal Bones"
b. "Radiography of the Immobile Trauma Patient"

Equipment:

a. Skull
b. Skull phantom
c. Cassettes and films
d. X-ray machine
e. Lead markers
f. Radiographs of the mandible, sinuses and temporal bones

CLASSROOM HOURS 8

(8.11)

INSTRUCTIONAL ACTIVITIES

Laboratory Practice:

b. Make radiographs of the phantom skull
c. Evaluate several radiographs of the mandible, sinuses and temporal bone for positioning accuracy and correct exposure

Clinical Application:

Have the learner make radiographs of the mandible, sinuses and temporal bones on a patient

EVALUATION (8.11)

a. Given a patient, a physician's orders and the necessary equipment, the learner will make radiographs of the mandible, sinuses, and temporal bone. All checklist items must be rated "acceptable."

b. Test items are available from Bontrager, Radiographic Anatomy and Positioning

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Positioned patient accurately for required projections		
4. Manipulated equipment quietly and correctly		
5. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 6. Demonstrated correct anatomical part.		
7. Aligned part, film and central ray properly.		
8. Used correct exposure factors.		
9. Identified film (Right and Left) (Patient)		

TASK

8.12 Making radiographs using mobile X-ray units

PERFORMANCE OBJECTIVE

Provided with a patient, physician's orders, and the necessary equipment, make radiographs with the mobile X-ray unit.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

8.01 through 8.11

Provide Information On:

a. The reasons for mobile radiographic exams
b. Operation of the mobile X-ray unit.
c. Special projections and/or positioning for mobile radiography
d. Limitations of the equipment
e. Special radiation protection measures
f. Exposure techniques

Provide A/Vs On:

Radiography of the Immobile Trauma Patient

Demonstration of task:

By instructor

Laboratory practice:

Have the learner:

a. Manipulate the mobile X-ray unit
b. Make radiographs of the phantom with the mobile X-ray units

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Watson
b. Selman

A/Vs:

Multi-media, "Radiography of the Immobile Trauma Patient."

Equipment:

a. Phantom
b. Mobile X-ray unit
c. Cassettes and films
d. Lead aprons and gloves
e. Identification markers

CLASSROOM HOURS 6

(8.12)

INSTRUCTIONAL ACTIVITIES

Clinical Application:

Have the learner make radiographs with the mobile X-ray unit

EVALUATION (8.12)

Given a patient, physician's orders and the necessary equipment, make radiographs using mobile X-ray unit. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Positioned patient accurately for required projections.		
4. Manipulated equipment quietly and correctly.		
5. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 6. Correct anatomical part was demonstrated.		
7. Aligned body part, film and central ray properly.		
8. Used correct exposure factors.		
9. Identified film (Right and Left of Patient).		

TASK

8.13 Making radiographs in the operating room

PERFORMANCE OBJECTIVE

Provided with a patient, physician's orders and the necessary equipment, make radiographs in the operating room.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 7.01 Putting on and removing sterile gloves
b. 7.02 Putting on and removing sterile gowns
c. 7.03 Putting on and removing masks
d. 8.12 Making radiographs using mobile X-ray units
e. Proper clothing for operating room
f. Radiation safety precautions for operating room personnel
g. Exposure techniques

Provide Information On:

a. Procedures requiring radiographs during surgery
b. Setting up X-ray equipment in surgery
c. Special positions and/or projections needed
d. Special precautions regarding radiography during surgical procedures

Demonstration of Task:

By instructor

Laboratory Practice:

a. Practice setting up equipment and dressing for surgery
b. Practice positioning in the operating room using another student as patient

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

Watson

Equipment:

a. Mobile X-ray unit
b. Surgical attire
c. Cassettes and film
d. Identification markers
e. Lead aprons

CLASSROOM HOURS 6

(8.13)

INSTRUCTIONAL ACTIVITIES

Clinical Application

Have the learner make radiographs in the operating room

EVALUATION (8.13)

Given a patient, physician's orders and a mobile radiographic unit, make radiographs in the operating suite. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Positioned patient accurately for required projections.		
4. Manipulated equipment quietly and correctly.		
5. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 6. Correct anatomical part was demonstrated.		
7. Aligned body part, film and central ray properly.		
8. Used correct exposure factors.		
9. Identified film (Right and Left of Patient).		

TASK

8.14 Assisting with contrast radiographs and fluorographic studies

PERFORMANCE OBJECTIVE

Provided with a patient and a fluorographic unit, assist the radiologist in making contrast and fluorographic studies.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

8.03 Making radiographs of the abdomen

Provide Information On:

a. Anatomy of the part examined
b. Purpose of the examination
c. Indications for the examination
d. Patient preparation
e. Setting up fluorographic equipment
f. Procedure for the examination
g. Type and amount of contrast media used
h. Basic overhead radiographic projections
i. Radiation safety during fluoroscopy
j. Exposure techniques

Demonstration of Task:

By instructor

Laboratory Practice:

Have the learner:

a. Practice the task using other students as the patient and radiologist
b. Make the required overhead projections of the phantom

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Merrill, 4th Ed., Vol. 3
b. Watson
c. Meschan

Equipment:

a. Fluoroscopic unit
b. Phantom
c. Contrast media
d. Cassettes and films
e. Identification markers
f. Lead gloves and apron
g. Radiographs

CLASSROOM HOURS	8

(8.14)

INSTRUCTIONAL ACTIVITIES

Laboratory Practice:

c. Evaluate several radiographs for positioning and exposure accuracy

Clinical Application:

Have learner assist with contrast and fluoroscopic studies on a patient.

EVALUATION (8.14)

Given a patient and a fluoroscopic unit, the learner will assist the radiologist in making contrast and fluorographic studies. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Prepared contrast media correctly.		
4. Set up fluoro equipment correctly for specific exam.		
5. Administered contrast media correctly.		
6. Manipulated equipment quickly and correctly.		
7. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 8. Demonstrated correct anatomical part.		
9. Aligned body part, film and central ray properly.		
10. Used correct exposure factors.		
11. Identified film (Right and Left of Patient).		

TASK

8.15 Making voiding cystourethrograms

PERFORMANCE OBJECTIVE

Provided with a patient, physician's orders and the necessary equipment, make voiding cystourethrograms (VCU).

INSTRUCTIONAL ACTIVITIES

Prerequisite:

8.03 Making radiographs of abdomen

Provide Information On:

a. Anatomy of the bladder & urethra
b. Purpose and indications for VCU
c. Patient preparation
d. Procedure for VCU
e. Type and amount of contrast media
f. Assisting with catheterization of the urinary bladder
g. Types and sizes of catheters
h. Radiographic projections used
i. Exposure techniques
j. Safety precautions

Demonstration of Task:

By instructor

Laboratory Practice:

Have the Learner:

a. Practice the procedure using a mannekin
b. Evaluate finished radiographs for positioning and exposure accuracy

Clinical Application:

Have the learner make radiographs for VCU's

INSTRUCTIONAL MATERIALS

Textbooks:

a. Merrill, 4th Ed. Vol. 3
b. Torres and Moore
c. Watson
d. Meschan

Equipment:

a. Catheters
b. Catheter ray
c. Contrast media
d. X-ray machine with fluoroscopic unit
e. Cassettes and film
f. VCU radiographs
g. Identification markers

CLASSROOM HOURS	4

EVALUATION (8.15)

Given a patient, physician's orders and the necessary equipment, the learner will make voiding cystourethrograms. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Prepared contrast media correctly.		
4. Set up fluoro equipment correctly for specific exam.		
5. Administered contrast media correctly.		
6. Manipulated equipment quickly and correctly.		
7. Demonstrated evidence of radiation protection for patient and self.		
8. Removed catheter properly.		
IMAGE EVALUATION 9. Demonstrated correct anatomical part		
10. Aligned part, film and central ray properly.		
11. Used correct exposure factors.		
12. Identified film (Right and Left of Patient).		

TASK

8.16 Making intravenous pyelograms

PERFORMANCE OBJECTIVE

Provided with a patient, physician's orders and the necessary equipment, make intravenous pyelograms (IVP).

INSTRUCTIONAL ACTIVITIES

Prerequisites:

8.03 Making radiographs of the abdomen

Provide Information On:

a. Anatomy and physiology of the urinary system
b. Purpose of an IVP
c. Indications for an IVP
d. Preparation of the patient
e. Procedure for an IVP
f. Type and amount of contrast media
g. Possible reactions to intravenous contrast media
h. Safety precautions
i. Rapid infusion and hypertensive IVP's
j. Correct exposure techniques

Demonstration of Task:

By instructor

Laboratory Practice:

Have the learner:

a. Assemble supplies and equipment for an IVP
b. Practice positioning using another student as the patient
c. Evaluate IVP radiographs for positioning and exposure accuracy

Clinical Application:

Have the learner make intravenous pyelograms of patients.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Merrill, 4th Ed. Vol. 3
b. Watson
c. Torres and Moore
d. Meschan

Equipment:

a. X-ray machine
b. Contrast media
c. Needles and syringes
d. Emergency tray
e. Identification markers
f. Cassettes and films
g. IVP radiographs

CLASSROOM HOURS 4

EVALUATION (8.16)

Given a patient, physician's orders and the necessary equipment, the learner will make intravenous pyelograms. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Prepared contrast media correctly.		
4. Administered contrast media correctly.		
5. Manipulated equipment quickly and correctly.		
6. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 7. Demonstrated correct anatomical part.		
8. Aligned part, film and central ray properly.		
9. Used correct exposure factors.		
10. Identified film (Right and Left of Patient).		
11. Time marker visible.		

TASK

8.17 Making intravenous cholangiograms

PERFORMANCE OBJECTIVE

Provided with a patient, physician's orders and the necessary equipment, make intravenous cholangiograms (IVC).

INSTRUCTIONAL ACTIVITIES

Prerequisites:

8.03 Making radiographs of the abdomen

Provide Information On:

a. Anatomy and physiology of the biliary system
b. Purpose and indications for IVC
c. Patient preparation
d. Procedure for IVC
e. Basic radiographic projections
f. Type and amount of contrast media
g. Possible reactions to intravenous contrast media
h. Safety precautions
i. Correct exposure techniques

Demonstration of Task:

By instructor

Laboratory Practice:

Have the learner:

a. Assemble supplies and equipment for an IVC
b. Practice positioning using another student as the patient
c. Evaluate IVC radiographs for positioning and exposure accuracy

Clinical Application:

Have the learner make intravenous cholangiograms

INSTRUCTIONAL MATERIALS

Textbooks:

a. Merrill, 4th Ed., Vol. 3
b. Watson
c. Meschan

Equipment:

a. X-ray machine
b. Contrast media
c. Needles and syringes
d. Emergency tray
e. Identification markers
f. Cassettes and films
g. IVC radiographs

CLASSROOM HOURS

2

EVALUATION (8.17)

Given a patient, physician's orders and the necessary equipment, the learner will make intravenous cholangiograms. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Prepared contrast media correctly.		
4. Administered contrast media correctly.		
5. Manipulated equipment quickly and correctly.		
6. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 7. Demonstrated correct anatomical part.		
8. Aligned part, film and central ray properly.		
9. Used correct exposure factors.		
10. Identified film (Right and Left of Patient).		
11. Identified time on film.		

TASK

8.17 Making intravenous cholangiograms

PERFORMANCE OBJECTIVE

Provided with a patient, physician's orders and the necessary equipment, make intravenous cholangiograms (IVC).

INSTRUCTIONAL ACTIVITIES

Prerequisites:

8.03 Making radiographs of the abdomen

Provide Information On:

a. Anatomy and physiology of the biliary system
b. Purpose and indications for IVC
c. Patient preparation
d. Procedure for IVC
e. Basic radiographic projections
f. Type and amount of contrast media
g. Possible reactions to intravenous contrast media
h. Safety precautions
i. Correct exposure techniques

Demonstration of Task:

By instructor

Laboratory Practice:

Have the learner:

a. Assemble supplies and equipment for an IVC
b. Practice positioning using another student as the patient
c. Evaluate IVC radiographs for positioning and exposure accuracy

Clinical Application:

Have the learner make intravenous cholangiograms

INSTRUCTIONAL MATERIALS

Textbooks:

a. Merrill, 4th Ed., Vol. 3
b. Watson
c. Meschan

Equipment:

a. X-ray machine
b. Contrast media
c. Needles and syringes
d. Emergency tray
e. Identification markers
f. Cassettes and films
g. IVC radiographs

CLASSROOM HOURS

2

EVALUATION (8.17)

Given a patient, physician's orders and the necessary equipment, the learner will make intravenous cholangiograms. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Prepared contrast media correctly.		
4. Administered contrast media correctly.		
5. Manipulated equipment quickly and correctly.		
6. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 7. Demonstrated correct anatomical part.		
8. Aligned part, film and central ray properly.		
9. Used correct exposure factors.		
10. Identified film (Right and Left of Patient).		
11. Identified time on film.		

TASK

9.01 Loading automatic injectors

PERFORMANCE OBJECTIVE

Provided with an automatic injector and contrast medium, load the injector.

INSTRUCTIONAL ACTIVITIES

Prerequisite Tasks:

a. 6.07 Preparing contrast media for IV injection
b. 7.04 Setting up a sterile field

Provide Information On:

a. Types of automatic injectors
b. Uses of automatic injectors
c. Safety precautions
d. Factors affecting flow rate
e. Injection time and pressure
f. Procedure for loading injector
g. Control panel settings

Demonstration of Tasks:

By instructor or special procedures personnel

Laboratory Practice:

Have the learner set up and load the automatic injector

Clinical Application:

Have the learner operate the automatic injector during a procedure in the X-ray department

INSTRUCTIONAL MATERIALS

Textbooks:

a. Snopek
b. Operator's manual for individual injectors

Equipment:

a. Automatic injector
b. Contrast media

CLASSROOM HOURS

2

EVALUATION (9.01)

Given an automatic injector and contrast medium, the learner will load the injector. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Connected all electrical and ground connections.		
2. Attached syringe to injector head.		
3. Filled syringe with contrast media without contaminating the syringe or contrast media.		
4. Attached syringe heater.		
5. Set delay type and time (One or the other MUST be depressed).		
6. Set pressure limit.		
7. Set linear rise time.		
8. Set flowrate and scale.		
9. Set volume.		
10. Set adjustable mechanical stop.		
11. Position injector head.		
12. Arm injector.		

TASK

9.02 Assisting with arteriography

PERFORMANCE OBJECTIVE

Provided with a specific angiographic procedure to be performed, a patient and the necessary equipment, set up for the examination and assist with the arteriogram.

INSTRUCTIONAL ACTIVITIES

Prerequisite Tasks:

a. 1.00 Introduction to radiography
b. 4.00 Patient care
c. 8.00 Routine radiographic procedures
d. 9.01 Operate automatic injectors
e. 10.01 Loading and unloading automatic film changers
f. PRE-3 Manipulating radiographic equipment

Provide Information On:

a. Anatomy and physiology of circulatory system
b. Purpose of examination
c. Angiographic catheters and needles
d. Arterial catheterization techniques
e. Radiographer's responsibilities during examination
f. Projections used
g. Contrast media used
h. Anatomy demonstrated
i. Radiation protection
j. Recordkeeping for procedure

Provide A/Vs On:

Angiography

Demonstration of Tasks:

By instructor and special procedures person

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Snopek
b. Merrill, 4th ed., vol. 2 and 3
c. Watson
d. Powell

A/Vs:

Multi-Media "Cerebral Angiography"

Equipment:

a. X-ray machine
b. Automatic injector
c. Automatic film changer
d. Angiographic catheters
e. Syringes and needles
f. Contrast media
g. Arteriogram tray
h. Sterile drapes and towels
i. ID markers
j. Arteriogram radiographs

CLASSROOM HOURS	10

(9.02)

INSTRUCTIONAL ACTIVITIES (continued)

Laboratory Practice:

a. Practice the procedure using another student as the patient
b. Evaluate finished radiographs for technical accuracy

Clinical Application:

a. Set up the room for an arteriogram in the X-ray department
b. Assist the physician with an arteriogram

EVALUATION (9.02)

Given an angiographic procedure, a patient and the necessary equipment, the learner will set up for the examination and assist with the arteriogram. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Set up fluoroscopy equipment.		
2. Set up serial filming device.		
3. Set up automatic injector.		
4. Set up sterile tray maintaining sterile technique.		
5. Prepare and draped injection site.		
6. Assisted the physician, maintaining sterile technique.		
7. Positioned patient correctly.		
8. Showed evidence of radiation protection.		
IMAGE EVALUATION 9. Demonstrated correct anatomical part.		
10. Aligned body part, film and control ray properly.		
11. Selected correct sequence of programming.		
12. Identified film (Right and left of patient)		

TASK

9.03 Assisting with venography

PERFORMANCE OBJECTIVE

Provided with a patient, physician's orders and the necessary equipment, assist in making venograms.

INSTRUCTIONAL ACTIVITIES

Prerequisite Tasks:

a. 1.00 Introduction to radiography
b. 4.00 Patient care
c. 8.00 Routine radiographic procedures
d. 10.00 Operating rapid film changer
e. PRE-3 Manipulating radiographic equipment
f. PRE-4 Setting controls on control panel

Provide Information On:

a. Anatomy of venous system, particularly lower extremity
b. Purpose of examination
c. Contrast media used
d. Equipment and supplies used
e. Procedure for examination
f. Recordkeeping

Demonstration of Tasks:

By instructor

Laboratory Practice:

a. Practice procedure using another student as the patient
b. Evaluate venogram radiographs for positioning and technique accuracy

Clinical Application:

Have learner assist with venography in the X-ray department

INSTRUCTIONAL MATERIALS

Textbooks:

a. Snopek
b. Merrill, 4th ed., vol. 3
c. Watson

Equipment:

a. X-ray machine
b. Syringes and needles
c. Contrast media
d. ID markers
e. Cassettes and films or automatic film changer
f. Venogram radiographs

CLASSROOM HOURS 2

EVALUATION (9.03)

Given a patient, physician's orders and the necessary equipment, the learner will assist the physician in making venograms. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct examination and views.		
2. Assembled necessary equipment and supplies.		
3. Prepared contrast media correctly.		
4. Administered contrast media correctly.		
5. Manipulated equipment quickly and correctly.		
6. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 7. Demonstrated correct anatomical part.		
8. Aligned body part, film and central ray properly.		
9. Used correct exposure factors.		
10. Identified film (Right and left of patient)		

TASK

9.04 Assisting with myelography

PERFORMANCE OBJECTIVE

Provided with a patient and the necessary equipment, assist the physician in making myelograms.

INSTRUCTIONAL ACTIVITIES

Prerequisite Tasks:

a. 1.00 Introduction to radiography
b. 4.00 Patient care
c. 8.00 Routine radiographic procedures
d. PRE-3 Manipulating radiographic equipment
e. PRE-4 Setting controls on control panel

Provide Information On:

a. Anatomy of spinal cord and canal
b. Equipment and supplies needed
c. Special safety precautions
d. Reason for examination
e. Anatomy visualized
f. Spinal injections
g. Labeling specimens
h. Contrast media used
i. Special post-myelographic patient care
j. Radiographic projections made

Demonstration of Tasks:

By instructor or observation in X-ray department

Laboratory Practice:

Practice procedure using another student as patient

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

a. Snopek
b. Merrill, 4th ed., vol. 3
c. Watson

Equipment:

a. X-ray machine with fluoroscopy
b. Myelogram tray
c. Myelogram needle
d. Contrast media
e. Cassettes and films
f. ID markers
g. Myelogram radiographs

CLASSROOM HOURS	2

(9.04)

INSTRUCTIONAL ACTIVITIES (continued)

Laboratory Practice: (continued)

Evaluate myelogram radiographs for positioning and exposure techniques.

Clinical Application:

Have the learner assist with myelograms in the X-ray department

EVALUATION (9.04)

Given a patient and the necessary equipment, the learner will assist the physician with a myelogram. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Prepared contrast media correctly.		
4. Set up fluoro equipment correctly for specific exam.		
5. Administered contrast media correctly.		
6. Manipulated equipment quickly and correctly.		
7. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 8. Demonstrated correct anatomical part.		
9. Aligned part, film and central ray properly.		
10. Used correct exposure factors.		
11. Identified film (Right and left of patient)		

TASK

9.05 Assisting with lymphangiograms

PERFORMANCE OBJECTIVE

Provided with a patient and the necessary equipment, assist the physician in making lymphangiograms.

INSTRUCTIONAL ACTIVITIES

Prerequisite Tasks:

a. 1.00 Introduction to radiology
b. 4.00 Patient care
c. 8.00 Routine radiographic procedures
d. PRE-3 Manipulating radiographic equipment
e. PRE-4 Setting the controls on the control panel

Provide Information On:

a. Anatomy of lymphatic system
b. Indicaions and contraindications for lymphangiography
c. Contrast media used
d. Procedure
e. Equipment needed
f. Patient positioning

Demonstration of Task:

By instructor

Laboratory Practice:

a. Practice the task using another student as the patient
b. Evaluate lymphangiograms for technical quality

Clinical Application:

Have the learner assist with lymphangiograms

INSTRUCTIONAL MATERIALS

Textbooks:

a. Snopek
b. Merrill's, 4th Ed., Vol. 3

Equipment:

a. Films and cassettes
b. Contrast media
c. Needles and syringes
d. Injector

CLASSROOM HOURS	2

EVALUATION (9.05)

Given a patient and the necessary equipment, the learner will assist the physician in making lymphangiograms. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct examination and views.		
2. Assembled necessary equipment and supplies.		
3. Prepared contrast media correctly.		
4. Administered contrast media correctly.		
5. Manipulated equipment quickly and correctly.		
6. Provided post-examination patient care.		
7. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 8. Demonstrated correct anatomical part.		
9. Aligned body part, film and central ray properly.		
10. Used correct exposure factors.		
11. Identified film (Right and left of patient).		

TASK

9.06 Assisting with Hysterosalpingograms

PERFORMANCE OBJECTIVE

Provided with a patient and the necessary equipment, assist the physician in making Hysterosalpingograms.

INSTRUCTIONAL ACTIVITIES

Prerequisite Tasks:

a. 1.00 Introduction to radiology
b. 4.00 Patient care
c. 8.00 Routine radiographic procedures
d. PRE-3 Manipulating radiographic equipment
e. PRE-4 Setting the controls on the control panel

Provide Information On:

a. Female reproductive system
b. Indications and contraindications for Hysterosalpingograms
c. Contrast media used
d. Procedure
e. Equipment needed
f. Patient positioning

Demonstration of Tasks:

By instructor

Laboratory Practice:

a. Practice the task using another student as the patient
b. Evaluate finished radiographs for positioning and technical accuracy

Clinical Application:

Have the learner assist with Hysterosalpingograms

INSTRUCTIONAL MATERIALS

Textbooks:

a. Snopek
b. Merrill's, 4th Ed., Vol. 3

Equipment:

a. Radiographic/fluorographic room
b. Cassettes and films
c. Contrast media
d. Identification markers
e. Vaginal speculum

CLASSROOM HOURS

2

EVALUATION (9.06)

Given a patient and the necessary equipment, the learner will assist the physician in making Hysterosalpingograms. All checklist items must be rated "acceptable".

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct examination and views.		
2. Assembled necessary equipment and supplies.		
3. Prepared contrast media correctly.		
4. Administered contrast media correctly.		
5. Manipulated equipment quickly and correctly.		
6. Provided post-examination patient care.		
7. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 8. Demonstrated correct anatomical part.		
9. Aligned body part, film and central ray properly.		
10. Used correct exposure factors.		
11. Identified film (Right and left of patient).		

TASK

9.07 Making pelvimetry radiographs

PERFORMANCE OBJECTIVE

Provided with a patient, physician's orders, and the necessary equipment, make pelvimetry radiographs.

INSTRUCTIONAL ACTIVITIES

Prerequisite Tasks:

a. 1.00 Introduction to radiography
b. 4.00 Patient care
c. 8.00 Routine radiographic procedures
c. PRE-3 Manipulating radiographic equipment
d. PRE-4 Setting controls on the control panel

Provide Information On:

a. Purpose for pelvimetry
b. Methods of pelvimetry
c. Patient positioning
d. Positioning of ruler or grid
e. Exposure techniques and accessories
f. Patient protection

Demonstration of Tasks:

By instructor

Laboratory Practice:

a. Practice positioning using a mannikin
b. Evaluate pelvimetry radiographs for positioning and technique

Clinical Application:

Have the learner make pelvimetry radiographs in the clinical area

INSTRUCTIONAL MATERIALS

Textbooks:

a. Merrill, 4th ed., vol. 3
b. Meschan

Equipment:

a. Mannikin
b. Cassettes and film
c. Colcher-Sussman pelvimeter or some other device
d. ID markers
e. Pelvimetry radiographs
f. Positioning aids (cushions, sponges)

CLASSROOM HOURS 2

EVALUATION (9.07)

Given a patient, physician's orders and the necessary equipment, the learner will make pelvimetry radiographs. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Positioned patient accurately for required projections.		
4. Manipulated equipment quietly and correctly.		
5. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 6. Correct anatomical part was demonstrated.		
7. Aligned body part, film and central ray properly.		
8. Used correct exposure factors.		
9. Identified film (Right and left of patient)		
10. Is Colcher-Sussman ruler visible?		

TASK

9.08 Making tomograms

PERFORMANCE OBJECTIVE

Provided with a patient, physician's orders, and a tomograph unit, make tomograms.

INSTRUCTIONAL ACTIVITIES

Prerequisite Tasks:

a. 1.00 Introduction to radiography
b. 4.00 Patient care (all)
c. 8.00 Routine radiographic procedures
d. PRE-3 Manipulating radiographic equipment
e. PRE-4 Setting controls on the control panel

Provide Information On:

a. Principles of tomography
b. Types of movements
c. Positioning of patient
d. Exposure techniques and accessories
e. Purpose of tomography
f. Radiation protection
g. Procedure for making tomograms

Demonstration of Tasks:

By instructor

Laboratory Practice:

a. Set up equipment for tomography
b. Make tomograms using phantom patient
c. Evaluated tomograms for positioning and technical accuracy

Clinical Application:

Have learner make tomograms in the clinical area

INSTRUCTIONAL MATERIALS

Textbooks:

a. Merrill, 4th Ed., Vol. 1
b. Christensen and others, 2nd Ed.
c. Selman
d. Cullinan

A/Vs:

Medi-Visuals, "Tomography" (overhead transparencies)

Equipment:

a. Tomographic unit
b. Cassettes and film
c. Identification markers
d. Phantom
e. Tomogram radiographs

CLASSROOM HOURS 4

EVALUATION (9.08)

Given a patient, physician's orders and a tomographic unit, the learner will make tomograms.

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies		
3. Positioned patient accurately for required projections.		
4. Manipulated equipment quietly and correctly.		
5. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 6. Correct anatomical part was demonstrated.		
7. Aligned body part, film and central ray properly.		
8. Used correct exposure factors.		
9. Identified film (Right and left of patient)		

TASK

9.09 Making stereoscopic radiographs

PERFORMANCE OBJECTIVE

Provided with a patient, physician's orders and a radiographic unit, make stereoscopic radiographs.

INSTRUCTIONAL ACTIVITIES

Prerequisite Tasks:

a. 1.00 Introduction to radiography
b. 4.00 Patient care
c. 8.00 Routine radiographic procedures
d. PRE-3 Manipulating radiographic equipment
e. PRE-4 Setting controls on the control panel

Provide Information On:

a. Principles of stereoscopy
b. Purpose of stereoscopy
c. Procedure for making stereo radiographs
d. Viewing of stereoscopic radiographs
e. Exposure technique and accessories

Demonstration of Tasks:

By instructor

Laboratory Practice:

a. Make stereoscopic radiographs using the radiographic phantom
b. Evaluate finished radiographs for technical accuracy

Clinical Application:

Have the learner make stereoscopic radiographs in the clinical area.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Thompson, Cahoon's, 9th ed.
b. Cullinan
c. Christensen
d. Selman
e. Meschan

Equipment:

a. X-ray machine
b. Cassette and films
c. Phantom
d. Identification markers
e. Stereoscopic viewer

CLASSROOM HOURS 2

EVALUATION (9.09)

Given a patient, physician's orders and a radiographic unit, the learner will make stereoscopic radiographs. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Positioned patient accurately for required projections.		
4. Manipulated equipment quietly and correctly.		
5. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 6. Correct anatomical part was demonstrated.		
7. Aligned body part, film and central ray properly.		
8. Used correct exposure factors.		
9. Identified film (Right and left of patient).		
10. Used stereo marker.		

TASK

9.10 Making macroradiographs

PERFORMANCE OBJECTIVE

Provided with a patient, physician's orders and the necessary equipment, make macroradiographs.

INSTRUCTIONAL ACTIVITIES

Prerequisite Tasks:

a. 1.00 Introduction to radiography
b. 4.00 Patient care
c. 8.00 Routine radiographic procedures
d. PRE-3 Manipulating radiographic equipment
e. PRE-4 Setting controls on control panel

Provide Information On:

a. Factors affecting magnification
b. Uses for macroradiography
c. Equipment needed
d. Magnification factor
e. Computing SID and object-image distance
f. Exposure technique and accessories

Demonstration of Tasks:

By instructor

Laboratory Practice:

a. Make magnification radiographs using the phantom
b. Evaluate macroradiographs for technical quality

Clinical Application:

Have the learner make macroradiographs in the clinical area

INSTRUCTIONAL MATERIALS

Textbooks:

a. Snopek
b. Selman
c. Christensen

Equipment:

a. X-ray machine
b. Phantom
c. Cassettes and films
d. ID markers

CLASSROOM HOURS	2

EVALUATION (9.10)

Given a patient, physician's orders and the necessary equipment, the learner will make macroradiographs. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Positioned patient accurately for required projections.		
4. Manipulated equipment quietly and correctly.		
5. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 6. Correct anatomical part was demonstrated.		
7. Aligned body part, film and central ray properly.		
8. Used correct exposure factors.		
9. Identified film (Right and left of patient).		

TASK

9.11 Making radiographs for long bone measurements

PERFORMANCE OBJECTIVE

Provided with a patient, physician's orders, and the necessary equipment, make radiographs of the lower extremities for long bone measurements.

INSTRUCTIONAL ACTIVITIES

Prerequisite Tasks:

a. 1.00 Introduction to radiography
b. 4.00 Patient care
c. 8.04 Making radiographs of the lower extremity
d. PRE-3 Manipulating radiographic equipment
e. PRE-4 Setting controls on control panel

Provide Information On:

a. Purpose of long bone measurements
b. Procedure for long bone measurements
c. Equipment needed
d. Exposure techniques and accessories
e. Radiation protection

Demonstration of Tasks:

By instructor

Laboratory Practice:

a. Make radiographs of the phantom for long bone measurement
b. Evaluate radiographs for long bone measurement for positioning and technique accuracy

Clinical Application:

Have learner make radiographs for long bone measurements in the X-ray department.

INSTRUCTIONAL MATERIALS

Textbooks:

Merrill, 4th ed., vol. 1

Equipment:

a. X-ray machine
b. Cassettes and film
c. Radiopaque ruler
d. Phantom
e. Identification markers

CLASSROOM HOURS 2

EVALUATION (9.11)

Given a patient, physician's orders and the necessary equipment, the learner will make radiographs of the lower extremities for long bone measurements. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Positioned patient accurately for required projections.		
4. Manipulated equipment quietly and correctly.		
5. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 6. Correct anatomical part was demonstrated.		
7. Aligned body part, film and central ray properly.		
8. Used correct exposure factors.		
9. Identified film (Right and left of patient).		
10. Ruler is visible.		

TASK

9.12 Assisting with sialograms

PERFORMANCE OBJECTIVE

Provided with a patient and the necessary equipment, assist the physician in making sialograms.

INSTRUCTIONAL ACTIVITIES

Prerequisite Tasks:

a. 1.00 Introduction to radiology
b. 4.00 Patient care
c. 8.00 Routine radiographic procedures
d. PRE-3 Manipulating radiographic equipment
e. PRE-4 Setting the controls on the control panel

Provide Information On:

a. Anatomy of the salivary glands
b. Indications and contraindications
c. Contrast media
d. Procedure
e. Equipment needed
f. Patient positioning

Demonstration of Tasks:

By instructor

Laboratory Practice:

a. Practice the task using another student as the patient
b. Evaluate sialograms for positioning and technique

Clinical Application:

Have learner assist with sialograms

INSTRUCTIONAL MATERIALS

Textbooks:

Merrill's, 4th Ed., Vol. 2

Equipment:

a. Cassettes and films
b. Contrast media
c. Needles and catheter

CLASSROOM HOURS 2

EVALUATION (9.12)

Given a patient and the necessary equipment, the learner will assist the physician in making sialograms. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct examination and views.		
2. Assembled necessary equipment and supplies.		
3. Prepared contrast media correctly.		
4. Administered contrast media correctly.		
5. Manipulated equipment quickly and correctly.		
6. Provided post-examination patient care.		
7. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 8. Demonstrated correct anatomical part.		
9. Aligned body part, film and central ray properly.		
10. Used correct exposure factors.		
11. Identified film (Right and left of patient).		

TASK

9.13 Assisting with arthrograms

PERFORMANCE OBJECTIVE

Provided with a patient and the necessary equipment, assist the physician in making arhtrograms.

INSTRUCTIONAL ACTIVITIES

Prerequisite Tasks:

a. 1.00 Introduction to radiology
b. 4.00 Patient care
c. 8.00 Routine radiographic procedures
d. PRE-3 Manipulating radiographic equipment
e. PRE-4 Setting the controls on the control panel

Provide Information On:

a. Anatomy of the joints
b. Joints frequently examined
c. Indications and contraindications for arthrography
d. Contrast media used
e. Equipment needed
f. Procedure
g. Patient positioning

Demonstration of Task:

By instructor

Laboratory Practice:

a. Practice the task using another student as the patient
b. Evaluate arthrograms for positioning and technique

Clinical Application:

Have learner assist with arthrograms

INSTRUCTIONAL MATERIALS

Textbooks:

a. Snopek
b. Merrill's, 4th Ed., Vol. 2

Equipment:

a. Radiography/fluorographic room
b. Cassettes and film
c. Contrast media
d. Needles and syringes

CLASSROOM HOURS 3

EVALUATION (9.13)

Given a patient and the necessary equipment, have the learner assist the physician in making arthrograms. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct examination and views.		
2. Assembled necessary equipment and supplies.		
3. Prepared contrast media correctly.		
4. Administered contrast media correctly.		
5. Manipulated equipment quickly and correctly.		
6. Provided post-examination patient care.		
7. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 8. Demonstrated correct anatomical part.		
9. Aligned body part, film and central ray properly.		
10. Used correct exposure factors.		
11. Identified film (Right and left of patient).		

TASK

9.14 Assisting with bronchograms

PERFORMANCE OBJECTIVE

Provided with a patient and the necessary equipment, assist the physician in making bronchograms.

INSTRUCTIONAL ACTIVITIES

Prerequisite Tasks:

a. 1.00 Introduction to radiology
b. 4.00 Patient care
c. 8.00 Routine radiographic procedures
d. PRE-3 Manipulating radiographic equipment
e. PRE-4 Setting the controls on the control panel

Provide Information On:

a. Anatomy of bronchial tree
b. Indications and contraindications for bronchography
c. Contrast media used
d. Methods of instilling contrast media
e. Equipment needed
f. Patient positioning
g. Post-examination patient care

Demonstration of Task:

By instructor

Laboratory Practice:

a. Practice the task using another student as the patient
b. Evaluate bronchograms for positioning and technical accuracy.

Clinical Application:

Have the learner assist with bronchograms

INSTRUCTIONAL MATERIALS

Textbooks:

a. Snopek
b. Merrill's, 4th Ed., Vol. 3

Equipment:

a. Radiographic room
b. Cassettes and films
c. Nasal catheters
d. Contrast media
e. Needles and syringes

CLASSROOM HOURS 3

EVALUATION (9.14)

Given a patient and the necessary equipment, the learner will assist the physician in making bronchograms. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct examination and views.		
2. Assembled necessary equipment and supplies.		
3. Prepared contrast media correctly.		
4. Administered contrast media correctly.		
5. Manipulated equipment quickly and correctly.		
6. Provided post-examination patient care.		
7. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 8. Demonstrated correct anatomical part.		
9. Aligned body part, film and central ray properly.		
10. Used correct exposure factors.		
11. Identified film (Right and left of patient).		

TASK

9.15 Assisting with fistula or sinus tract radiographs

PERFORMANCE OBJECTIVE

Provided with a patient with a fistula or sinus tract and a fluoroscopic unit, assist the radiologist with fistula or sinus tract radiographs.

INSTRUCTIONAL ACTIVITIES

Prerequisite Tasks:

a. 1.00 Introduction to radiology
b. 3.00 Patient care
c. 7.00 Routine radiographic procedures
d. 9.01 Loading and unloading the photospot camera
e. PRE-3 Manipulating radiographic equipment
f. PRE-4 Setting the controls on the control panel

Provide Information On:

a. Purpose of procedure
b. Equipment and supplies needed
c. Contrast material used
d. Administering the contrast media
e. Radiation protection
f. Exposure techniques

Demonstration of Tasks:

By instructor

Laboratory Practice:

a. Practice the procedure using another student as the patient
b. Evaluate finished radiographs for positioning and technique.

(continued on next page)

INSTRUCTIONAL MATERIALS

Textbooks:

Merrill, 4th ed., vol. 3

Equipment:

a. X-ray machine
b. Catheters
c. Syringes
d. Contrast media
e. Gauze and tape
f. Cassettes and film
g. ID markers

CLASSROOM HOURS 2

(9.15)

INSTRUCTIONAL ACTIVITIES

Clinical Application:

Have the student assist with the procedure in the X-ray department.

EVALUATION (9.15)

Given a patient with a fistula or sinus tract, the learner will assist the radiologist with radiographs. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Prepared contrast media correctly.		
4. Set up fluoro equipment correctly for specific exam.		
5. Administered contrast media correctly.		
6. Manipulated equipment quickly and correctly.		
7. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 8. Demonstrated correct anatomical part.		
9. Aligned body part, film and central ray properly.		
10. Used correct exposure factors.		
11. Identified film (Right and left of patient)		

TASK

9.16 Making special views of the skeletal system

PERFORMANCE OBJECTIVE

Provided with an X-ray machine, a patient and physician's orders, make special views of the skeletal system.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

8.01 through 8.17

Provide Information On:

a. Special views of the upper extremity
b. Special views of the lower extremity
c. Special views of the vertebral column
d. Special views of the cranium
e. Special views of the facial bones

Demonstration By:

Instructor

Laboratory Practice:

Have the learner make special views on the phantom

Clinical Application:

Have the learner make special views as request in the X-ray department

INSTRUCTIONAL MATERIALS

Textbooks:

Merrill's, 4th ed., vol. 1, 2 and 3

CLASSROOM HOURS 20

EVALUATION (9.16)

Given an X-ray machine, patient and physician's orders, the learner will make special views. All items on the checklist must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Positioned patient accurately for required projections.		
4. Manipulated equipment quietly and correctly.		
5. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 6. Demonstrated correct anatomical part.		
7. Aligned part, film and central ray properly.		
8. Used correct exposure factors.		
9. Identified film (Right and left of patient).		

TASK

10.01 Loading film holders

PERFORMANCE OBJECTIVE

Provided with a film holder, load the holder.

INSTRUCTIONAL ACTIVITIES

Provide Information On:

a. Types of film holders
b. Safe illumination
c. Location of films
d. Procedure for loading holders

Demonstration task:

By instructor or student who has mastered task or darkroom personnel.

Laboratory Practice:

Have the learner demonstrate how to load various types of holders.

Clinical Application:

Have the learners load film holders in the clinical area.

INSTRUCTIONAL MATERIALS

Equipment:

a. Film holders
b. Films

CLASSROOM HOURS

1

EVALUATION (10.01)

Given a film holder and film, load the holder so that the film is not fogged.

TASK

10.02 Loading and unloading automatic film changers

PERFORMANCE OBJECTIVE

Provided with an automatic film changer, load and unload the changer.

INSTRUCTIONAL ACTIVITIES

Provide Information on:

a. Types of film changers
b. Operating principles of film changers
c. Film types and sizes
d. Loading film in the darkroom
e. Safety precautions
f. Removing and replacing film receiver
g. Removing and replacing loading magazine

Demonstration of Task:

By instructor or darkroom personnel

Laboratory Practice:

Have the learner practice loading and unloading the film changer

Clinical Application:

Have the learner load and unload the film changer in the clinical area

INSTRUCTIONAL MATERIALS

Textbooks:

a. Snopek
b. Manufacturer's operator's manual for specific film changers
c. Cullinan

Equipment:

a. Automatic film changer
b. Radiographic film

CLASSROOM HOURS 4

EVALUATION (10.02)

Given an automatic film changer, the learner will load and unload the changer without exposing the film or causing the changer to jam.

TASK

10.03 Processing exposed film in an automatic processor

PERFORMANCE OBJECTIVE

Provided with an exposed radiographic film, process it in an automatic processor.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

10.01 loading film holders

Provide Information on:

a. Illumination in the darkroom
b. Handling x-ray film
c. Feeding the film into the processor
d. Processing artifacts

Clinical Application:

Have the learner process films in the x-ray department

Demonstration of Task:

By instructor or student who has mastered task

Laboratory Practice

a. Have the learner process several films

b. Evaluate the processed films for artifacts

INSTRUCTIONAL MATERIALS

Textbooks:

a. Thompson, Cahoons
b. Selman

CLASSROOM HOURS 1

EVALUATION (10.03)

Given an exposed radiograph, the learner will process it in an automatic processor so that it does not contain any artifacts nor is exposed to white light.

TASK

10.04 Evaluating radiographs for processing artifacts

PERFORMANCE OBJECTIVE

Provided with several radiographs, identify processing artifacts.

INSTRUCTIONAL ACTIVITIES

Provide Information on:

a. Fog
b. Common artifacts
c. Increased density artifacts
d. Decreased density artifacts

Clinical Application:

Have the learner evaluate radiographs for processing artifacts in the x-ray department

Provide A/Vs on:

Processing artifacts

Demonstration of Task:

By instructor

Laboratory Practice:

Have the learner identify artifacts or several radiographs in the laboratory

INSTRUCTIONAL MATERIALS

Textbooks:

a. Thompson, *Cahoon's*

A/Vs

a. ASRT Video tapes "Radiographic Processing"
b. Equipment manufacturers' commercial representatives

Equipment:

Radiographs with artifacts

CLASSROOM HOURS 1

EVALUATION (10.04)

Given several radiographs, the learner will identify processing artifacts. The learner's list of artifacts must agree within 90% of the instructor's list.

TASK

10.05 Cleaning film processing equipment

PERFORMANCE OBJECTIVE

Provided with an automatic processor, clean the processor.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

Processing exposed film in the automatic 10.03 processor

Provide Information on:

a. Automatic processing systems
b. Parts of the automatic processor
c. Operation of the automatic processor
d. Chemistry of automatic processing
e. Daily, weekly and periodic maintenance procedures
f. Cleaning solutions and materials to be used
g. Safety precautions

Provide A/Vs on:

Automatic Processing Maintenance

Demonstration of Tasks:

By instructor or qualified personnel in clinical area

Laboratory Practice:

a. Have the learner demonstrate the procedures

Clinical Application:

Have the learner clean the automatic processors in the x-ray department

INSTRUCTIONAL MATERIALS

Textbooks:

a. Thompson, Cahoon's
b. Selman,
c. Hiss

A/Vs:

a. ASRT, "Automatic Processing" Video tapes
b. Film manufacturers' presentations

Equipment:

a. Processor
b. Cleaning solutions
c. Non-abrasive cleaning pads
d. Safety goggles
e. Spare parts

CLASSROOM HOURS 6

EVALUATION (10.05)

Given an automatic processor, the learner will clean the processor so that it is clean and the processing chemicals are not contaminated. Test film must be clean and the image sharp.

TASK

10.06 Making quality control checks for film processor

PERFORMANCE OBJECTIVE

Provided with a sensitometer and densitometer, make a quality control check of the automatic film processor.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

Processing exposed film in the automatic 10.03 processor

Provide Information on:

a. Definition and purpose of sensitometry
b. Sensitometric properties of radiographic film
c. Exposing film in the sensitometer
d. Reading the densitometer
e. Graphing the required data
f. Information that needs to be recorded
g. Acceptable ranges

Provide A/Vs on:

Quality control tests

Demonstration of Tasks:

By instructor

Laboratory Practice:

a. Have the learner demonstrate the procedure for making quality control checks

Clinical Application:

Have the learner make *daily* quality control checks on the processors in the x-ray department for one week

INSTRUCTIONAL MATERIALS

Textbooks:

a. Thompson, *Cahoon's*
b. Selman
c. Christensen
d. Bushong

A/Vs:

a. Available from film manufacturers
b. ASRT, "Automatic Processing" Video tapes

Equipment:

a. Densitometer
b. Sensitometer
c. Film
d. Graph paper

CLASSROOM HOURS 2

EVALUATION (10.06)

Given a sensitometer and densitometer, make a quality control ch check of the automatic processor. Densitometer reading must agree within ± 10% of instructor's quality control check.

TASK

10.07 Testing safelight performance

PERFORMANCE OBJECTIVE

Provided with a cassette, radiographic film, x-ray machine, and processor, determine whether the safelight is fogging the film.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

10.03 Processing exposed film in an automatic processor

Provide Information on:

a. Types of safelight filters
b. Results of unsafe illumination
c. Procedure for testing safelight

Demonstration of Task:

By instructor

Laboratory Practice:

Have the learner demonstrate the procedure for testing safelight illumination

Clinical Application:

Have the learner test the safelight illumination in the processing rooms in the x-ray department.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Thompson, Cahoon's
b. Selman

Equipment:

a. 2 cassettes with films
b. X-ray machine
c. Processor

CLASSROOM HOURS 1

EVALUATION (10.07)

Given a cassette, film, x-ray machine and processor, the learner will determine whether the safelight is fogging the film. The determination must agree with the instructor's established standard.

TASK

10.08 Numbering cassettes and screens for identification

PERFORMANCE OBJECTIVE

Provided with radiographic film cassettes with intensifying screens, number the screens for identification.

INSTRUCTIONAL ACTIVITIES

Provide Information on:

a. Need for numbering screens
b. How to determine the number to be used
c. Procedure for numbering the screen and cassette

Clinical Application:

Have learner number new screens

Demonstration of Task:

By instructor

Laboratory Practice:

Have the learner practice numbering on old screens and cassettes

INSTRUCTIONAL MATERIALS

Equipment:

a. Cassettes with screens
b. Ballpoint pen or pencil

CLASSROOM HOURS 1

EVALUATION (10.08)

Given cassettes with intensifying screens, the learner will number for identification. All numbers must be legible on the processed film and match numbers on the back of the cassettes.

TASK

10.09 Cleaning intensifying screens

PERFORMANCE OBJECTIVE

Provided with a cassette with intensifying screens and the necessary materials, clean the screens.

INSTRUCTIONAL ACTIVITIES

Provide Information on:

a. Materials used to clean screens
b. Cleaning solutions for screens
c. Method for cleaning screens
d. Drying the screens

Clinical Application:

Have the learner clean intensifying screens in the clinical area

Demonstration of Task:

By instructor

Laboratory Practice:

Have the learner demonstrate the procedure for cleaning screens

INSTRUCTIONAL MATERIALS

Textbooks:

a. Thompson, Cahoon's
b. Selman,

Equipment:

a. Cassettes
b. Soft cloth
c. Screen cleaning solution

CLASSROOM HOURS 30 min.

EVALUATION (10.09)

Given a cassette, screen cleaner and soft cloths, the learner will clean the intensifying screen. Screen must not be nicked, scratched or chipped while being cleaned, and must be free of smudges and foreign particles.

TASK

10.10 Testing cassettes for screen contact

PERFORMANCE OBJECTIVE

Provided with a cassette and the necessary equipment, test the cassette for screen contact.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 10.01 Loading film holders
b. 10.03 Processing exposed film in the automatic processor
c. PRE-3 Manipulating radiographic equipment
d. PRE-4 Setting controls on the control panel

Provide Information on:

a. Effect of poor screen contact
b. Causes of poor screen contact
c. Materials needed
d. Exposure technique
e. Appearance of finished radiograph

Demonstration of Task:

By instructor

Laboratory Practice:

a. Have the learner test cassettes for screen contact
b. Evaluate several completed tests for screen contact

Clinical Application:

Have the learner test cassettes in the x-ray department for screen contact

INSTRUCTIONAL MATERIALS

Textbooks:

a. Thompson, Cahoon's
b. Selman
c. Cullinan

Equipment:

a. Cassettes with screens
b. Film
c. Wire mesh
d. X-ray machine
e. Several completed test

CLASSROOM HOURS

30 min.

EVALUATION (10.10)

Given a cassette, wire mesh, radiographic unit and film, the learner will test the cassette for screen contact. The test results must correspond with the instructors test results.

TASK

10.11 Describing silver reclamation

PERFORMANCE OBJECTIVE

Provided with information and related instruction, describe the three main methods of silver reclamation.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

10.03 Process a film in the automatic processor

Provide Information on:

a. Reasons for silver reclamation
b. Metallic replacement method
c. Electrolytic method
d. Chemical precipitation method
e. Advantages of silver reclamation
f. Price of silver recovery unit vs. monetary return

Laboratory Practice:

Have the learner write a description of the 3 methods of silver reclamation and the most practical applications of each

INSTRUCTIONAL MATERIALS

Textbooks:

a. Thompson, Cahoon's
b. Technical publications - from film manufacturers

CLASSROOM HOURS 2

EVALUATION (10.11)

Given information and related instruction, the learner will describe the three methods of silver reclamation. Evaluation will be by written exmination based on criteria established by the instructor.

TASK

11.01 Setting up fluoroscopic equipment

PERFORMANCE OBJECTIVE

Provided with a radiographic/fluoroscopic room, set up the fluoroscopic equipment for use.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. PRE-4 Setting controls on control panel
b. 9.01 Loading and unloading photospot camera

Provide Information On:

a. Image intensification tubes
b. Advantage of cone vision vs. rod vision
c. Components for conventional fluoroscopy
d. Components for image intensification
e. Purposes of fluroroscopy
f. Setting up fluoroscopic equipment
g. Exposure settings

Demonstration of Task:

By instructor

Laboratory Practice:

Have the learner practice setting up the fluoroscopic equipment

Clinical Application:

Have the learner set up the fluoroscopic equipment for specific examinstions in the X-ray department

INSTRUCTIONAL MATERIALS

Textbooks:

a. Thompson, Equipment
b. Christensen

Equipment:

Radiography/fluoroscopy room

CLASSROOM HOURS 4

EVALUATION (11.01)

Given a radiographic/fluoroscopic room, the learner will set up the fluoroscopic equipment for use. The equipment must be set up to meet established departmental procedures and standards.

TASK

11.02 Loading and unloading a photospot camera

PERFORMANCE OBJECTIVE

Provided with a photospot camera and film, load and unload the camera.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. PRE-3 Manipulating radiographic equipment
b. PRE-4 Setting the controls on the control panel

Provide Information On:

a. Operation of photospot camera
b. Type of film used
c. Precautions against fogging film
d. Procedure for loading film and routing it in the camera
e. Procedure for cutting film and unloading

Demonstration of Task:

By instructor

Laboratory Practice:

Have the learner practice loading and unloading the camera

Clinical Application:

Have the learner load and unload the camera

INSTRUCTIONAL MATERIALS

Textbooks:

Manufacturer's operator's manual

CLASSROOM HOURS

1

EVALUATION (11.02)

Given a photospot camera and film, the learner will load and unload the camera. The film must advance smoothly and must not be fogged.

TASK

11.03 Setting up video recording equipment

PERFORMANCE OBJECTIVE

Provided with videotape, videodisc and cineradiographic recording equipment, set up the equipment for use.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

11.01 Setting up fluoroscopic equipment

Provide Information On:

a. Operation of videotape, videodisc and cineradiographic equipment
b. Radiation dose to the patient with each
c. Advantages and disadvantages
d. Resolution capabilities of each

Demonstration of Task:

By instructor or department personnel

Laboratory Practice:

Have the learner set up each type of equipment for use

Clinical Application:

Have the learner set up recording equipment in the X-ray department

INSTRUCTIONAL MATERIALS

Textbooks:

a. Thompson, Equipment
b. Cullinan
c. Christensen

Equipment:

a. X-ray machine
b. Videotape equipment
c. Videodisc equipment
d. Cineradiographic equipment

CLASSROOM HOURS 2

EVALUATION (11.03)

Given videotape, videodisc and cineradiographic recording equipment, set up the equipment for operation so that the images are recorded and the equipment does not jam.

TASK

11.04 Making sonograms

PERFORMANCE OBJECTIVE

Given ultrasound equipment, a patient and physician's orders, make sonograms.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

4.00 Patient care

Provide Information On:

a. Sound waves vs. electromagnetic radiation
b. A-mode, B-mode and M-mode
c. Relationship between velocity of sound, frequency and wavelength
d. Propogation of sound waves through a medium
e. Characteristics of display modes
f. Techniques for different body parts
g. Anatomy demonstrated on sonograms
h. Evaluation of sonograms

Demonstration of Tasks:

By instructor or ultrasound technologist

Clinical Application:

a. Observe the procedure in the ultrasound department
b. Make sonograms under the direction of the ultrasound technologist

INSTRUCTIONAL MATERIALS

Textbooks:

a. Merrill, 4th Ed., Vol. 3
b. Christensen
c. Thompson, Equipment
d. Sarti and Sample

Equipment:

Ultrasound equipment

CLASSROOM HOURS 2

EVALUATION (11.04)

Given a patient, ultrasound equipment and physician's orders, the learner will make sonograms that demonstrate the requested anatomy to the physician's satisfaction.

TASK

11.05 Making xeroradiographs

PERFORMANCE OBJECTIVE

Provided with a patient, physician's orders and the necessary equipment, make xeroradiographs.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 4.00 Patient care
b. 8.00 Routine radiograph procedures
c. PRE-3 Setting the controls on the control panel
d. PRE-4 Manipulating radiographic equipment

Provide Information On:

a. Formation and transfer of the xeroradiographic image
b. Positive and negative modes
c. Resolution of xeroradiographs vs. conventional radiographs
d. Processing xeroradiographs
e. Exposure techniques with xeroradiography

Demonstration of Task:

By instructor

Laboratory Practice:

Have the learner:
a. Practice making xeroradiographs
b. Evaluate xeroradiographs for technique

Clinical Application:

Have the learner make xeroradiographs in the X-ray department.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Thompson, Cahoon's, 9th Ed.
b. Selman
c. Cullinan

Equipment:

a. X-ray machine
b. Xerographic plates
c. Xerographic processing equipment
d. Phantom
e. Identification markers

CLASSROOM HOURS 2

EVALUATION (11.05)

Given a patient, physician's orders and the necessary equipment, the learner will make xeroradiographs. All checklist items must be rated "acceptable."

PERFORMANCE CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
1. Evaluated requisition to determine correct exam and views.		
2. Assembled necessary equipment and supplies.		
3. Positioned patient accurately for required projections.		
4. Manipulated equipment quietly and correctly.		
5. Demonstrated evidence of radiation protection for patient and self.		
IMAGE EVALUATION 6. Demonstrated correct anatomical part.		
7. Aligned part, film and central ray properly.		
8. Used correct exposure factors.		
9. Identified film (Right and Left) (Patient)		

TASK

11.06 Making thermograms

PERFORMANCE OBJECTIVE

Provided with thermography equipment, a patient and physician's orders, make thermograms.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

4.00 Patient care

Provide Information On:

a. Physical basis for thermography
b. Applications of thermography
c. Equipment used
d. Procedure for the examination
e. Effects of focus, contrast and brightness

Demonstration of Task:

By instructor

Laboratory Practice:

Have the learner:
  a. Practice the task using another student as the patient
  b. Evaluate thermograms for gross abnormalities and technical quality

Clinical Application:

Have the learner make thermograms of patients in the clinical areas.

INSTRUCTIONAL MATERIALS

Textbooks:

Merrill, 4th Ed., Vol. 3

Equipment:

Thermography equipment

CLASSROOM HOURS 1

EVALUATION 11.06

Given thermography equipment, a patient, and physician's orders, the learner will make thermograms. The thermogram must meet the physician's specifications.

TASK

11.07 Exposing and developing a Polaroid film packet

PERFORMANCE OBJECTIVE

Provided with a Polaroid film packet and the necessary equipment, expose and develop the Polaroid packet.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. PRE-3 Manipulating radiographic equipment
b. PRE-4 Setting the controls on the control panel

Provide Information On:

a. Components of the Polaroid packet
b. Development of the image
c. Processing the Polaroid film
d. Uses of the Polaroid film

Demonstration of Task:

Demonstration of Task:

By instructor

Laboratory Practice:

Have the learner:
  a. Practice making Polaroid radiographs
  b. Evaluate the radiographs for technical accuracy

Clinical Application:

Have the learner make Polaroid radiographs in the clinical area.

INSTRUCTIONAL MATERIALS

Textbooks:

Thompson, *Cahoon's*

Equipment:

a. X-ray machine
b. Polaroid film
c. Polaroid processor

CLASSROOM HOURS 1

EVALUATION (11.07)

Given a Polaroid film packet and the necessary equipment, expose and process the film. The image must be sharp with no processing artifacts.

TASK

11.08

PERFORMANCE OBJECTIVE

Provided with CT equipment, a patient and the physician's orders, make CT scan.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

a. 1.00 Introduction to radiologic technology
b. 4.00 Patient care
c. 8.01 Positioning the patient in basic positions

Provide Information On:

a. Principles of operation of CT
b. Cross-sectioned anatomy
c. Indications and preparation
d. Contrast studies
e. Patient positioning
f. Manipulation of the equipment
g. Techniques

Demonstration of Task:

By instructor or CT personnel

Laboratory Practice:

Have the learner practice the task using a radiograph phantom.

Clinical Application:

Have the learner make CT scans in the department.

INSTRUCTIONAL MATERIALS

Textbooks:

a. Thompson, Equipment
b. Christensen

Equipment:

a. CT equipment
b. Phantom

CLASSROOM HOURS 4

EVALUATION (11.08)

Given CT equipment, a patient and physician's orders the learner will make computed tomography scans. The scan must meet the physician's specifications.

TASK

11.09 Duplicating radiographs

PERFORMANCE OBJECTIVE

Provided with a radiograph duplicator and film, duplicate the radiograph.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

10.05 Processing exposed film in an automatic processor

Provide Information On:

a. Duplicating film characteristics
b. Operating the duplicator
c. Exposure times for duplication
d. Procedure for duplication

Demonstration of Task:

By instructor

Laboratory Practice:

Have the learner practice duplicating radiographs.

Clinical Application:

Have the learner duplicate radiographs in the X-ray department

INSTRUCTIONAL MATERIALS

Textbooks:

Thompson, *Cahoon's*

Equipment:

a. Radiograph
b. Duplicator
c. Duplicating film

CLASSROOM HOURS 1

EVALUATION 11.09

Given a radiograph, duplicator and duplicating film, the learner will duplicate the film. The duplicate must be identical to the original.

TASK

11.10 Subtracting radiographs

PERFORMANCE OBJECTIVE

Provided with radiographs, subtraction film and a duplicator-subtractor, subtract radiographs.

INSTRUCTIONAL ACTIVITIES

Prerequisites:

10.05 Processing exposed film in automatic processor

Provide Information On:

a. Subtraction film
b. Purpose for subtraction
c. Equipment and radiographs needed
d. Procedure for subtraction

Demonstration of Task:

By instructor

Laboratory Practice:

Have the learner practice subtraction techniques

Clinical Application:

Have the learner subtract radiographs in the X-ray department

INSTRUCTIONAL MATERIALS

Textbooks:

Thompson, Cahoon's

Equipment:

a. Duplicator/subtractor
b. Subtraction film
c. Angiogram scout (no contrast media)
d. Angiogram (with contrast media)

CLASSROOM HOURS 1

EVALUATION 11.10

Given radiographs, subtraction films and a duplicator/subtractor, the learner will subtract the radiographs. The contrast media image must be sharp and clear with all other structures subtracted.

SECTION VI

REFERENCES, RESOURCES

INSTRUCTIONAL RESOURCE MATRIX

Introduction

The following Instructional Resource Matrix lists the instructional resources required to carry out the learning activities in each unit in the program. The resources are divided into three categories.

A/Vs. Each type of A/V is identified by a symbol as follows: Filmstrips (FS), Slides (S), Slides/Tapes (ST), Tapes (T), Video Tapes (VT), Movie Film (MF), Transparencies (TR), Film Loops (FL).

Textbooks. Identified by author.

Student Materials (Instructional Units). Identified by title.

Textbook List

This list identifies the textbooks referenced on the Unit Guides and the Instructional Resource Matrix.

Instructional Units

The publisher(s) of the instructional units referenced on the Unit Guides and the Instructional Resource Matrix are listed.

Audiovisuals

The supplier(s) of the audiovisuals referenced on the Unit Guides and the Instructional Resource Matrix are listed.

Additional Instructional Resources

Textbooks. Provides a list of textbooks in addition to those referenced on the Unit Guides.

Audiovisuals. Provides a list of suppliers of audiovisuals in addition to those referenced on the Unit Guides. Also identifies the type(s) of audiovisuals available.

Models/Simulators/Replicas. Provides a list of suppliers of instructional models.

Individualized Instruction. Identifies suppliers of individualized instruction materials in addition to those referenced on the Unit Guides.

Resource Addresses

Provides the addresses of textbook publishers and the suppliers of audiovisuals models and instructional units.

CURRICULUM AREA: Radiologic Technology

TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
RELATED INSTRUCTION (Cognitive Skills)			
SF-1 Describing the general body plan and structural units		Dienhart; Jacobi	
SF-2 Describing the structure and classifications of bones		Dienhart; Jacobi; Merrill	
SF-3 Describing muscles that cast a shadow on radiographs		Dienhart; Jacobi;	
SF-4 Describing the nervous system and special senses		"	
SF-5 Describing the transportation of materials through the body		Dienhart; Jacobi; Merrill	
SF-6 Describing the functions of the systems responsible for maintaining metabolism		Dienhart; Jacobi; Merrill	
SF-7 Describing the intergration and control of body functions by hormones		Dienhart; Jacobi	
SF-8 Describing the reproductive system		"	
PRE-1 Using mathematical calculations to determine exposure techniques		Selman; Thompson; Cahoon's	

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TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
PRE-2 Describing the properties of electromagnetic radiation	X-ray Production (FS)	Christensen, Selman	
PRE-3 Manipulating radiographic equihment			
PRE-4 Setting controls on the panel		Selman; Thompson; Equipment	
PRE-5 Describing formation of the radiographic image		Thompson; Cahoon's; Selman; Christenson	
PRE-6 Determining milliampere-seconds, distance and kilovoltage for a specific radiographic projection	Introduction to the physics of Diognostic Radiology (FS) low dosage Medical Radiograghy and Geometry of Image Formation (FS)	Thompson, Cahoon's; Selman; Hiss; Christensen; Bushong; U.S. Dept of Health and Human services	
PRE-7 Selecting intensifying screens for radiographic examinations	Contact equipment Manufacturers	Thompson, Cahoon's; Selman; Christenson	
PRE-8 Evaluating radiographs for image quality	Introduction to the Physics of Diagontic Radiography (FS) Low Dosage medical Radiography and Geometry of Image Formation (FS)	Thompson, Cahoon's; Hiss; Selman; Christenson; Bushong; U.S. Dept. of Human Service	

CURRICULUM AREA: Radiologic Technology

TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
PRE-9 Adjusting exposure techniques for unusual conditions		Thompson, Cahoon's	
PRE-10 Making fixed KV and variable KV technique charts		"	
RP-1 Describing the structure of matter	matter energy and the Nuclear Atom (ES)	Selman; Christensen	
RP-2 Describing electrostatics and magnetism		Selman; Christenson	
RP-3 Describing electrical circuits	X-ray Production (ES) Electrical Hazards in the X-ray department (FS) Energy, Ohms Low and Basic circuits (FS)	"	
RP-4 Describing x-ray generating apparatus	Modern X-Ray tubes and Generators (FS)	"	
RP-5 Describing the production of X-rays and X-ray tubes	X-Ray Production (FS)	Selman; Christenson; Thompson, Equipment	
RP-6 Describing properties of X-rays	Interaction with Matter and Properties Of Radiographs (FS)	Selman; Christenson	
RP-7 Identifying Components of X-ray circuit and equipment		Selman; Thompson, Equipment; Christenson	

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TASK LISTING		INSTRUCTIONAL MATERIAL REFERENCES		
		Audio-Visuals	Textbooks	Student Materials
Pro-1	Explaining interactions of radiation and matter	Introduction to Radiation Physics Technology: Interactions of Radiation with matter (FS)	Selman; Christenson; Frankel	
Pro-2	Listing the quanities and units of measurement of radiation	Radiological Health (FS) Radiation Protection (FS)	"	
RBO-1	Describing long and Short term biological effects of radiation	Radiological Health (FS) Radiation Protection (FS)	Frankel; Selman; Christenson; Travis; Pizzarello	
RBO-2	Describing the factors influencing the response of organisms to radiation		Frankel; Travis; Pizzarello	
RBO-3	Describing the genetic effect of radiation exposure		Travis; Frankel; Pizzarello	
RBO-4	Describing the effects of radiation on the embryo		"	
RBO-5	Describing the effects of low radiation on immunity		Travis; Pizzarello	
RBO-6	Explaining the role of radiation therapy in the management of cancer		Boyd; Selman	
P-1	Listing sources of disease		Boyd; Thompson, Primer	

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TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
P-2 Describing disturbances in blood flow and body fluids		Boyd; Thompson, *Primer*	
P-3 Describing inflammation, infection and repair of tissue		Boyd	
P-4 Defining and listing symptoms of degenerative diseases		Boyd; Thompson, *Primer*	
P-5 Describing common diseases affecting the body systems		Boyd; Thompson, *Primer*	

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TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
1.01 Describing the history of radiography		Watson	
1.02 Describing program guidelines and organization			
1.03 Demonstrating a professional attitude in dealing with patients and co-workers		Watson; Torres and Moore	
2.01 Index and file radiographs			
2.02 File records such as correspondence, publications, regulations and policies			
2.03 Forward radiographic reports to physicians			
2.04 Process loans of radiographs			
2.05 Maintain radiology work record for statistical pruposes			
2.06 Prepare supply requests			
2.07 Prepare charges and credits for patient billing			
2.08 Prepare safety and accident reports		Wood and Rambo	
2.09 Check for signed permit forms		"	

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TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
2.10 Interview and record patient's medical history		Watson, 4th ed.; Wood and Rambo	
3.01 Issue and collect radiation defectors such as film badges			
3.02 Provide radiation protection for self, co-workers and patients	Radiography - Radiation Protection (FS) Radiological Health (FS)	Frankel; Selman, 6th ed; Merrill, 4th ed. Vol. 1; NCRP Report No. 33	
4.01 Washing hands	Medical Asepsis (FS)	Hornemann; Wood, 1972, Vol. 2; Torres and Moore	
4.02 Caring for a patient receiving IV infusion	Care of Your Patient Receiving Intravenous Therapy (FS)	Hornemann; Lewis; Torres and Moore; Watson, 4th ed.	
4.03 Transporting patients in a wheelchair	Transfer Activities and Ambulation (FS)	Hornemann; Wood and Rambo; Torres and Moore; Watson, 4th ed.	
4.04 Transporting a patient on a stretcher	Lifting and Moving Patients (FS)	Hornemann; Lewis; Torres and Moore; Watson, 4th ed.	

CURRICULUM AREA: Radiologic Technology

TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
4.05 Turning patients in bed	Positioning to prevent Complications (FS)	Broadwell and Milutinovic; Lewis; Torres and Moore; Watson, 4th ed.	
4.06 Taking blood pressure	Blood Pressure (FS)	Hornemann; Lewis; Wood, 2nd ed.; Torres and Moore	
4.07 Taking pulse and respiration	Temperature, Pulse and Respiration (FS)	Hornemann; Lewis; Wood, 2nd ed.; Torres and Moore	
5.01 Administering oxygen	Oxygen administration (FS)	Hornemann; Lewis; Torres and Moore; Watson	
5.02 Providing first aid for a victum of shock		Torres and Moore; Watson, 4th ed.; Wood and Rambo	
5.03 Providing first aid for convulsing patient		Wood and Rambo; Torres and Moore; Watson, 4th ed.	

CURRICULUM AREA: Radiologic Technology

TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
5.04 Providing assistance for a vomiting patient		Torres and Moore; Watson	
5.05 Providing first aid for a patient who has fainted		Torres and Moore; Watson	
5.06 Giving cardiopulmonary resuscitation to a patient with cardiac arrest	Provided by resource person	Georgia Heart ASSN.; Red Cross	
5.07 Providing first aid for external hemorrhage	Shock and Hemorrhage (FS)	Grant and Murray; Thompson and Rosdahl; Watson, 4th ed.	
5.08 Maintain emergency tray			
6.01 Preparing the patient for radiographic examination		Torres and Moore	
6.02 Handling a patient with a spine and skull injury		Torres and Moore; Watson, 4th ed.	
6.03 Handling a patient with a fractured hip or extremities		Torres and Moore; Watson, 4th ed.	
6.04 Restraining pediatric patients for radiographic examinations		Torres and Moore; Merrills, 4th ed., Vol. 3	

CURRICULUM AREA: Radiologic Technology

TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
6.05 Administering contrast media rectally/via stoma		Hornemann; Lewis; Torres and Moore; Watson, 4th ed; Merrill's, 4th ed., Vol. 3	
6.06 Administering contrast media orally	Radiography: Contrast Media (FS)	Torres and Moore; Watson; Merrill's, 4th ed., Vol. 3	
6.07 Preparing contrast media for intravenous injection	Radiography: Contrast Media (FS) Radiography: Reactions to Contrast Media (FS)	Torres and Moore; Watson; Merrill's 4th ed., Vol. 3	
7.01 Putting on and removing sterile gloves	Sterile Technique and Dressing Change (FS)	Hornemann; Lewis; Powell Torres and Moore	
7.02 Putting on and removing sterile gown	Operating room scrubbing, gowning and gloving (FS) Isolation Techniques (FS)	Torres and Moore; Powell; Watson	
7.03 Putting on and removing mask	Isolation Techniques (FS)	Lewis; Wood and Rambo; Watson, 4th ed.; Torres and Moore	
7.04 Setting up a sterile field	Sterile Technique and Dressing Change (FS)	Broadwell; Lewis; Wood, Vol. 2; Torres and Moore; Powell	

CURRICULUM AREA: Radiologic Technology

TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
7.05 Scrubbing patient's skin	Preoperative skin preparation (FS)	Powell; Torres and Moore	
7.06 Making radiographs in the isolation unit	Isolation Techniques (FS)	Torres and Moore; Watson	
8.01 Positioning the patient in basic positions	Introduction to Terminology and Basic Principles of Radiographic Positioning (FS)	Bontrager; Merrill's	
8.02 Making radiographs of the chest	Radiographic Anatomy and Positioning of the Chest (FS)	Merrill's Vol. 3, Bontrager; Meschan	
8.03 Making radiographs of the abdomen	Radiographic Anatomy and Positioning of the Chest (FS)	"	
8.04 Making radiographs of the upper extremity and shoulder girdle	Radiographic Anatomy and Positioning of the Upper Extremity (FS) Radiography of the Immobile Trauma Patient (FS)	"	
8.05 Making radiographs of the lower extremity	Radiographic Anatomy and Positioning Toes, Foot, Ankle and Leg, Knee, Patella and Femur (FS) Radiography of the Immobile Trauma Patient (FS)	Merrill, Vol. 1; Bontrager; Meschan	

CURRICULUM AREA: Radiologic Technology

TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
8.06 Making radiographs of the pelvis and hips	Radiographic Anatomy and Positioning Hips and Pelvis (FS)	Merrill, Vol. 1 Bontrager; Meschan	
8.07 Making radiographs of the vertebral column	Radiographic Anatomy and Positioning of the Coccyx, Sacrum, Lumbor Spine, Cervical and Thoracic Spine (FS) Radiographic Anatomy and Positioning Hips and Pelvis (FS)	"	
8.08 Making radiographs of the bony thorax	Radiographic Anatomy and Positioning of the Bony Thorax (FS) Radiography of the Immobile Trauma Patient (FS)	Merrill, Vol. 1; Bontrager; Meschan	
8.09 Making radiographs of the cranial bones	Radiographic Anatomy and Positioning of Cranium, Stella, Trucica, and Petrous Pyramids (FS) Radiography of the Immobile Trauma Patient (FS)	Merrill. Vol. 2; Bontrager; Meschan	
8.10 Making radiographs of the facial bones	Radiographic Anatomu and Positioning Facial Bones, Zygomatic Arches, and Optic Foramina (FS) Radiography of the Immobile Trauma Patient (FS)	"	

CURRICULUM AREA: Radiologic Technology

TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
8.11 Making radiographs of the mandible, sinuses and temporal bones	Radiographic Anatomy and Positioning of the Mandible, Sinuses and and Temporal Bones (FS) Radiography of the Immobile Trauma Patient (FS)	Merrill, Vol. 1; Bontrager; Meschan	
8.12 Making radiographs using mobile X-ray units	Radiography of the Immobile Trauma Patient (FS)	Watson; Selman	
8.13 Making radiographs in the operating room		Watson	
8.14 Assisting with contrast radiographs and fluorographic studies		Merrill, Vol. 3; Watson; Meschan	
8.15 Making voiding cystourethrograms		Merrill, Vol. 3; Torres and Moore; Watson; Meschan	
8.16 Making intravenous pyelograms		"	
8.17 Making intravenous cholangiograms		Merrill, Vol. 3; Watson; Meschan	
9.01 Loading automatic injectors		Snopek; Operator's Manuals	
9.02 Assisting with arteriography	Cerebral Angiography (FS)	Snopek; Merrill, Vol. 2 and 3; Watson; Powell	

CURRICULUM AREA: Radiologic Technology

TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
9.03 Assisting with venography		Snopek; Merrill, Vol. 3; Watson	
9.04 Assisting with myelography		Snopek; Merrill, Vol. 3; Watson	
9.05 Assisting with lymphangiograms		Snopek; Merrill, Vol. 3	
9.06 Assisting with hysterosalpingograms		"	
9.07 Making pelvimetry radiographs		Merrill, Vol. 3; Meschan	
9.08 Making tomograms	Tomography (TR)	Merrill, Vol. 1; Christensen; Selman; Cullinan	
9.09 Making stereoscopic radiographs		Thompson, Cahoon's; Cullinan; Christensen; Selman; Meschan	
9.10 Making macroradiographs		Snopek; Selman; Christensen	
9.11 Making radiographs for long bone measurements		Merrill, Vol. 1	
9.12 Assisting with sialograms		Merrill, Vol. 2	

CURRICULUM AREA: Radiologic Technology

TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
9.13 Assisting with arthrograms		Snopek; Merrill, Vol. 2	
9.14 Assisting with bronchograms		Snopek; Merrill, Vol. 3	
9.15 Assisting with fistula or sinus tract radiographs		Merrill, Vol. 3	
9.16 Making special views of the skeletal system		Merrill, Vol. 1, 2 and 3	
10.01 Loading film holders			
10.02 Loading and unloading automatic film changers		Snopek; Operator's Manuals; Cullinan	
10.03 Processing exposed film in an automatic processor		Thompson, Cahoon's; Selman	
10.04 Evaluating radiographs for processing artifacts	Radiographic Processing (VT) Equipment Manufacturers	Thompson, Cahoon's	
10.05 Cleaning film processing equipment	Automatic Processing (VT) Equipment Manufacturers	Thompson, Cahoon's; Selman; Hiss	
10.06 Making quality control checks for film processing	"	Thompson, Cahoon's; Selman; Christensen; Bushong	

CURRICULUM AREA: Radiologic Technology

TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
10.07 Testing safelight performance		Thompson, Cahoon's; Selman	
10.08 Numbering cassettes and screens for identification			
10.09 Cleaning intensifying screens		Thompson, Cahoon's; Selman	
10.10 Testing cassettes for screen contact		Thompson, Cahoon's; Selman; Cullinan	
10.11 Describing silver reclamation		Thompson, Cahoon's; Manufacturer's Technical Publications	
11.01 Setting up fluoroscopic equipment		Thompson, Equipment; Christensen	
11.02 Loading and unloading a photospot camera		Operator's manual	
11.03 Setting up video recording equipment		Thompson, Equipment; Cullinan; Christensen	
11.04 Making sonograms		Merrill, Vol. 3; Christensen;	

CURRICULUM AREA: Radiologic Technology

TASK LISTING	INSTRUCTIONAL MATERIAL REFERENCES		
	Audio-Visuals	Textbooks	Student Materials
		Thompson, Equipment; Sarti and Sample	
11.05 Making xeroradiographs		Thompson, Cahoon's; Selman; Cullinan	
11.06 Making thermograms		Merrill, Vol. 3	
11.07 Exposing and developing a polaroid film packet		Thompson, Cahoon's	
11.08 Making computed tomography scans		Thompson, Equipment; Christensen	
11.09 Duplicating radiographs		Thompson, Cahoon's	
11.10 Subtracting radiographs		Thompson, Cahoon's	

TEXTBOOK LIST

Bontrager, and Anthony, Radiographic Anatomy and Positioning, Student Workbook, 2nd Ed., Multi-Media Pub., 1976.

Boyd, and Sheldon, An Introduction to the Study of Disease, 7th Ed., Lea and Febiger, 1977.

Broadwell and Milutinovic, Medical-Surgical Nursing Procedures, Delmar, 1977.

Bushong, Radiologic Science for Technologists, Mosby, 1975.

Christensen, et al, An Introduction to the Physics of Diagnostic Radiology, 2nd Ed., Lea and Febiger, 1978.

Cullinan and Cullinan, Illustrated Guide to X-Ray Technics, 2nd Ed., Lippincott, 1980.

Dienhart, Basic Human Anatomy and Physiology, 3rd Ed., Saunders, 1979.

Frankel, Radiation Protection for Radiologic Technologists, McGraw-Hill, 1976.

Grant and Murray, Emergency Care, Brady, 2nd Ed., 1978.

Hiss, Understanding Radiology, Thomas, 1978.

Hornemann, Basic Nursing Procedures, Delmar, 1979.

Jacobi, Textbook of Anatomy and Physiology in Radiologic Technology, 2nd Ed., Mosby, 1975.

Lamel, et al, The Correlated Lecture Laboratory Series in Diagnostic Radiological, U.S. Dept. of Human Services, 1981.

Lewis, Fundamental Skills of Patient Care, Lippincott, 1976.

Merrill, Atlas of Roentgenographic Positions and Standard Radiologic Procedures, Vol. 1, 2 and 3, 4th Ed., Mosby, 1975.

Meschan, Radiographic Positioning and Related Anatomy, 2nd Ed., Saunders, 1978.

Milliken, Understanding Human Behavior, Delmar, 1969.

NCRP Report #33, Medical X-Ray and Gamma-Ray Protection for Energies Up to 10MeV, National Council on Radiation Protection and Measurement.

Pizzarello, and Witcofski, Basic Radiation Biology, 2nd Ed., Lea and Febiger, 1975.

Powell, Handbook for Radiologic Technologists and Special Procedures Nurses in Radiology, Thomas, 1971.

Sarti and Sample, Diagnostic Ultrasound, G and K Hall, 1980.

Selman, The Fundamentals of X-Ray and Radium Physics, 6th Ed., Thomas, 1977.

Smith and Davis, Medical Terminology: A Programmed Text, 3rd Ed., Wiley and Sons, 1976.

Snopek, Fundamentals of Special Radiographic Procedures, McGraw-Hill, 1975.

Taber's Cyclopedic Medical Dictionary, 13th Ed., F.A. Davis, 1979.

Thompson and Rosdahl, Textbook of Basic Nursing, Lippincott, 2nd Ed., 1973.

Thompson, Cahoon's Formulating X-Ray Techniques, 9th Ed., Duke University Press, 1979.

Thompson, A Practical Approach to Modern X-Ray Equipment, Little and Brown, 1978.

Thompson, Primer of Clinical Radiology, 2nd Ed., Little and Brown, 1980.

Torres, and Moore, Basic Medical Techniques and Patient Care for Radiologic Technologists, Lippincott, 1979.

Travis, Primer of Medical Radiobiology, Medical Yearbook Pub., 1975.

Watson, Patient Care and Special Procedures in Radiology, 4th Ed., Mosby, 1974.

Wood and Rambo, Nursing Skills for Allied Health Services, 2nd Ed., Saunders, 1977.

AUDIOVISUALS

Trainex Corporation, sound filmstrips for the health care field.

Multi-media Publishing, Inc., Sound filmstrips for Radiographic Technology.

American Society of Radiologic Technologists, Video Tapes.

ADDITIONAL INSTRUCTIONAL RESOURCES

Textbooks

Boyd, Basic Science Principles of Nuclear Medicine, Mosby, 1974.

Brady's Programmed Orientation to Medical Terminology, Brady, 1970.

Brooks and Brooks, The Human Body, Structure and Function in Health and Disease, 2nd Ed., Mosby, 1980.

Fisher, Basic Medical Terminology, Bobs-Merrill, 1975.

Graham and Thomas, An Introduction to Physics for Radiologic Technologists, Saunders, 1975.

Jackson, Basic Nuclear Physics for Medical Personnel, Thomas, 1973.

Jensen, Fundamentals of Ear Tomography, Thomas, 1971.

Memler and Wood, Structure and Function of the Human Body, 2nd Ed., Lippincott, 1977.

Smith and Davis, Medical Terminology: A Programmed Text, 3rd Ed., Wiley, 1976.

Stevens and Phillips, Comprehensive Review for the Radiologic Technologist, 3rd Ed., Mosby, 1977.

Thomas, (Ed), Taber's Cyclopedic Medical Dictionary, 13th Ed., F.A. Davis Company, 1977.

V'TECS, A Catalog of Performance Objectives, Criterion-Referenced Measures and Performance Guides for Radiographers, Vocational-Technical Education Consortium of States, 1980.

Young and Likes, Medical Specialty Terminology, Vol. II, Mosby, 1972.

Audiovisuals

American Cancer Society	16 mm films
American Learning Systems	Sound filmstrips
Career Aids	Sound filmstrips Transparencies
Concept Media	Sound filmstrips
Human Relations Media	Sound filmstrips

Lippincott	Sound filmstrips Slides/tapes 16 mm film Videotapes Filmloops Self-instructional audiovisual modules
National Archives Trust Fund Board	16 mm film Video cassettes (rent or purchase)
Robert J. Brady	Overhead transparencies Slides/tapes Video tapes Sound filmstrips Audio tapes
Vocational Educational Materials Center (VEMC)	Slide/tapes

Models/Simulators/Replicas

Trainex

Fisher Scientific Company

Nystrom

Individualized Instruction

Lippincott	Self-instructional modules

RESOURCE ADDRESSES

American Cancer Society
Georgia Division, Inc.
2025 Peachtree Road NE
Atlanta, GA 30309

American Learning Systems,
Inc.
P.O. Box 2173
Columbus GA 31902
(404) 327-2619

American Society of Radiologic
Technologists
500 N. Michigan Ave. Suite 836
Chicago, Illinois 60611

Appleton-Century-Croft
292 Madison Avenue
New York, NY 10017
(212) 532-1700

Bobbs-Merrill Co., Inc.
4300 W. 62nd. St.
Indianapolis, IN 46468
(317) 298-5400

Career Aids Inc.
8950 Lurline Avenue
Chatsworth, CA 91311

Concept Media
P.O. Box 19542
Irvine, CA 92714

C.V. Mosby Company
11830 Westline Industrial Dr.
St. Louis, MO 63141

Delmar Publishers
Division of Litton Educ. Pub.
Inc.
50 Wolf Road
Albany, NY 12205

Duke University Press
College Station
Durham, NC 27708
(919) 684-2173

E. I. duPont de Nemours & Co.
P.O. Box 80368
Atlanta, GA 30366

F.A. Davis Company
1945 Arch Street
Philadelphia, PA 19103
(215) 568-2270

Fisher Scientific Company
Educational Materials Div.
4901 W. LeMoyne Street
Chicago, IL 60651

General Electric Company
Training and Education Programs
1 River Road, Building 22,
Room 232
Box MK
Schenectady, NY 12345

G.K. Hall
70 Lincoln St.
Boston, MA 02111
(617) 423-3990

Human Relations Media
175 Tompkins Avenue
Pleasantville, NY 10570

J.B. Lippincott Company
Health Professions Publications
East Washing Square
Philadelphia, PA 19105
(800) 523-2945

John Wiley and Sons, Inc.
605 Third Ave.
New York, NY 10016
(212) 867-9800

Lea and Febiger
Washington Square
Philadelphia, PA 19106
(215) 922-1330

Little, Brown and Co.
34 Beacon St.
Boston, MA 02106
(617) 227-0730

Macmillan Publishing Co., Inc.
866 Third Avenue
New York, NY 10022
(212) 935-2000

McGraw-Hill Book Company
1221 Avenue of the Americas
New York, NY 10020
(212) 997-1221

Multi-Media Publishing, Inc.
1393 South Inca Street
Denver, CO 80223
(303) 778-1404

National Archives Trust Fund
Board
National Audiovisual Center
Washington, DC 20409

Nystrom
3333 Elston Avenue
Chicago, IL 60618
(312) 463-1144
(Local Rep)
John Wilhelm
4778 Devon Way
Stone Mountain, GA 30088
(404) 981-7608

Robert J. Brady Company
Subs of Prentice Hall
Routes 197 and 450
Bowie, MD 20715
(301) 262-6300

W. B. Saunders Company
Subs of Columbia Broadcasting
System
W. Washington Square
Philadelphia PA 19105
(215) 574-4700

Thomas Publishing Co.
1 Penn. Plaza
New York, NY 10001
(212) 695-0500

Trainex Corporation
P.O. Box 116
Garden Grove, CA 92642
(800) 854-2485

Vocational Education Materials
Center (VEMC)
Green Street
University of Georgia
Athens, GA 30602

Williams and Wilkins Co.
428 E. Preston St.
Baltimore, MD 21202
(301) 528-4221

SECTION VII

STUDENT RECORDS

STUDENT RECORDS

This section contains several forms that may prove useful in evaluating students and maintaining records of progress. All of the forms, with the exception of the Student Competency Record, are printed with the permission of the Albany Area Vocational-Technical School, Radiologic Technologist program. In addition to these forms, many of the Unit Guides (Section V) have checklists for that task.

The Student Competency Record provides a listing of all tasks in the program. A space is designated for the student's name, program identification D.O.T. number, job title and a check off column to initial and date competency completion:

INDIVIDUAL PROGRESS REPORT

NAME ______________________________

PROGRAM/ CLUSTER ______________________________ AREA ______________________________

TASK/ UNIT NO.	UNIT TITLE	DATE STARTED	DATE COMP.	EST. TIME	GRADE

GROUP PROGRESS CHART

NAME	UNITS/TASKS																				

CLINICAL GRADING PROCEDURE

Possible Grade Points	
30	General Clinical Evaluation 20 points - Performance Objectives 10 " - Student Merit
10	Record Maintenance 0-5 Complete, 0-5 On time
5	Article Reactions 3 articles - 5 points
5	Radiographic quizzes, Spot checks
50	Clinical Competency Evaluations Average of minimum examinations 29 - 50 points 27-28 - 45 points 25-26 - 40 points
100	Total Possible Grade Points

General Clinical Evaluation

There are two forms used in the General Clinical Evaluation. The first is used to measure performance objectives in the different rotation areas, General Radiography, Fluoroscopy, Mobile and Surgical, Weekend and Evenings. This evaluation comprises 20% of the total clinical grade. The second form is used primarily to determine student merit or professional attributes. We realize this form can be very subjective therefore it is worth 10% of the total clinical grade. All monthly General Clinical Evaluations are averaged to determine the final quarterly grade point average.

These forms will be given to the student at the end of each monthly rotation for use by the staff technologist supervising the student during the rotation. It is the student's responsibility to see that these forms are completed and signed by the technologist and student.

Record Maintenance

The following records are to be submitted to the Clinical Coordinator to be considered complete: Clinical Hours Sheet, Daily and Monthly Practicum, and Equipment Description. All records are due the first school day of the following month unless otherwise specified by the Clinical Coordinator. One point will be deducted from the monthly grade point average for each day these records are late.

The Clinical Rotation Schedule is to be filled out by the student during each quarter. Students' schedules are worked out in advance by the clinical coordinator. It is important that any variations in room assignment and types of exams performed be recorded on this form by the student.

This form is to be submitted at the end of each quarter.

Clinical Competency Evaluation Record Form

The student must follow the Evaluation Record Form for his/her completion of the 90% routine (44 exams) and the 60% specials (7 exams) requirement for Graduation. The form is colored to indicate by quarter the examinations in which the student may be evaluated. Substitution is allowed only with the permission of the clinical coordinator. If the minimum number of examinations evaluated is not attained 3 points will be deducted from the quarter grade average for each uncompleted examination.

During the second year, the students will be rotating through other areas of Radiologic Technology and the hours spent in these areas must be recorded on the Evaluation Record Form. The students must also be sure during these quarters the 90% and 60% completion requirements of routines and specials to be eligible for the Registry testing in July.

Spot Checks

Students will be spot checked by the clinical coordinator. Spot checks consist of observing a student perform a complete exam on a patient, filling out a Clincial Competency Evaluation form and discussing the evaluation with the student.

Radiographic Quizzes

During those times when the patient load is light in the clinical area, students will be expected to complete various radiographic quizzes. These quizzes may include identifying radiographic anatomy, film critique, etc.

Article Reactions

Students are required to write one paragraph reactions to three different articles from Radiologic Technology and other health related journals. The form to be used is as follows:

Name of Article. Author. Name of Journal and Volume: Page, Year.
Three extra reactions may be handed in for five points extra credit.

CLINICAL COMPETENCY EVALUATION

The Clinical Competency Evaluation form is used in the following manner: a student wants to be evaluated for a routine chest examination for example. First he must have satisfactorily completed the appropriate module on chest positioning in the classroom and have observed and assisted in a number of chest examinations in the cinical area. Only after the above factors are met can any student begin to be evaluated.

The student notifies the clinical instructor or presents the technologist with the evaluation form when the examination for which he is prepared becomes available. The student fills in his name, the exam to be evaluated, the views taken, date, patient name and xray number. The grade sheet has been designed for evaluating a maximum of three views per examination. Each exam requested necessitates a separate grade sheet. Additional grade sheets are necessary for those exams with more than three views.

The evaluator grades the sheet according to the given criteria for performance evaluation. A check ( ) or X to indicate that point value is marked in each area. The radiographs are then presented to the clinical instructor for image evaluation and final grading. A grade point average of 25 is required to pass each exam, provided no score of 0 is recieved on any section of the evaluation. If a student scores less than 25 points on any one view, it must be repeated in the future. Instead of a number grade for the second attempt, they will recieve a letter grade of S, satisfactory or U, unsatisfactory. There is only one chance to perform an evaluation for a number grade. Failure to score S after three attempts will result in an F in Clinical Practice.

Grade points will be assigned by averaging all quarterly clinical competency evaluations:

29 points - 50 final grade points
27 - 28 points - 45 " "
25 - 26 points - 40 " "

The following is a list of the minimum number of examinations to be evaluated for each quarter:

Junior	Fall quarter	- 4 exams	(yellow section)
	Winter	- 7 "	(yellow, orange sections)
	Spring	- 11 "	(yellow, orange, blue sections)
Senior	Summer	- 9 "	" " "
	Fall	- 9 "	" " "
	Spring	- 4 "	" " "

CRITERIA FOR PERFORMANCE EVALUATION

A. Evaluation of Requisition.

You are able to:
- A. Identify procedures to be done.
- B. Give the patient's age and name.
- C. Call the patient's name.

B. Physical Facilities Readiness.

You are able to:
- A. Keep the table clean.
- B. Keep the cabinets and tables in order.
- C. Have appropriate size cassettes available.
- D. Have emesis basins and drugs ready.
- E. Locate syringes and needles as necessary.
- F. Turn the machine "on" and be ready for exposures.
- G. Turn tube in position ready for the examination.
- H. Find and resupply linens as necessary.

1. Patient and Technologist Relationships.

You are able to:
- A. Select the correct patient.
- B. Assist the patient to the radiographic room.
- C. Assist the patient from whatever his mode of travel to the radiographic table.
- D. Keep the patient covered for privacy.
- E. Talk with the patient in a gentle manner.
- F. Give proper instructions for moving and breathing.
- G. Have the patient gowned properly.
- H. Follow proper procedure for isolation of patient if needed.

2. Positioning Skills.

You are able to:
- A. Position the patient correctly on the table (head at the right end, prone or supine).
- B. Align center of part to be demonstrated to the middle of the film.
- C. Center the beam to the center of the film.
- D. Oblique the patient correctly if required.
- E. Angle the central ray to the center of the film.
- F. Remove unnecessary anatomical parts from the radiographic area.

3. Equipment Manipulation.

You are able to:
- A. Turn tube from horizontal to vertical (and vice versa).
- B. Move the bucky tray and utilize lock.
- C. Correctly identify and utilize tube locks.
- D. Insert and remove cassettes from bucky tray and spot film device.
- E. Select factors at control panel.
- F. Use a technique chart.
- G. Measure the patient.

H. Identify the film with "R" or "L".
I. Fill syringes using aseptic technique.
J. Direct mobile unit.
K. Operate controls for mobile unit.
L. Select proper cassette size.
M. Adapt for technique changes in FFD, grid ratio and collimation.

4. Evidence of Radiation Protection.

You are able to:
A. Cone or collimate to part.
B. Use gonad shields, if appropriate.
C. Wear lead apron and gloves if appropriate.
D. Wear film badge as directed by institution.
E. Select proper exposure factors.
F. Adjust exposure techniques for motion.

CRITERIA FOR IMAGE EVALUATION

RADIOGRAPH DEMONSTRATES:

5. Anatomical part(s).
A. Part is shown in proper prospective.
B. No motion present.

6. Proper alignment.
A. Film centered.
B. Part centered.
C. Tube centered.
D. Patient obliqued or rotated correctly.

STANDARD RADIOGRAPHIC EXPOSURE

7. Radiographic techniques.
A. Chart was used correctly (proper contrast and density).
B. Factors manipulated for pathology.
C. Correct exposure used to produce image.

8. Film Identification.
A. "R" or "L" in correct place.
B. Minute or hour markers visible.
C. Name, x-ray no., and date identifiable.

9. Radiation Protection.
A. Cone or collimation marks visible.
B. No repeats.
C. Gonad shields in place (if used).

RADIOLOGIC TECHNOLOGY PROGRAM

__________________________ VOCATIONAL-TECHNICAL SCHOOL

Individual Attendance Record

STUDENT__________________________________MONTH & YEAR____________________

DATE	CLINICAL HOURS	CLASS HOURS	TOTAL
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			

SUMMARY

TOTAL DAYS PRESENT____________________

TOTAL DAYS ABSENT____________________

MAKE UP TIME____________________

VACATION OR HOLIDAYS____________________

CLINICAL PROGRESS EVALUATION

GENERAL RADIOGRAPHY

DOES THE STUDENT:	YES	NO
1. Correctly follow warm-up procedures for radiographic tubes?		
2. Select and use appropriate accessories, including restraining devices, cones, collimators, grids? (Specify problem areas).		
3. Correctly set up tomographic attachments?		
4. Position the patient correctly for general radiographic procedures? (Specify problem areas).		
5. Evaluate finished radiographs for positioning accuracy and technical quality?		
6. Prepare contrast media for appropraite procedures in this area? (Specify problem areas).		
7. Select the proper technique for routine situations?		
8. Make appropriate adjustments for the unusual case by manipulating time, milliamperage, and kilovoltage?		
9. Keep room furnishings and accessories properly placed and safely positioned?		
10. Provide radiation protection for patients using proper collimation, techniques, and appropriate shielding?		
11. Provide radiation protection for personnel and guests?		
12. Follow directions?		
13. Arrive in the clinical area on time?		
14. Dress appropriately for clinical practice?		
Total "YES"		

POSSIBLE SCORE 14

STUDENT ____________________

1st Year 2nd Year

SATISFACTORY SCORES
(FIRST YEAR STUDENTS) 11

(SECOND YEAR STUDENTS) 13

DATE ____________________

EVALUATOR ____________________

(PLEASE COMMENT ON BACK)

STUDENT'S NAME ______________________________

______________________ VOCATIONAL-TECHNICAL SCHOOL

Radiologic Technology Program
Clinical Education

Daily Practicum Record

DATE	HISTORY NUMBER	PATIENT'S NAME	TYPE OF EXAM	EXAM		REASON FOR REPEAT
				AIDED	NOT AIDED	

STUDENT'S NAME ______________________________ MONTH AND YEAR ____________________

____________________________ VOCATIONAL-TECHNICAL SCHOOL

Radiologic Technology Program
Clinical Education

Monthly Practicum Record

EXAMINATION	NUMBER OF EXAMS	
	Aided	Not Aided
Upper Extremity: Finger		
Hand		
Wrist		
Forearm		
Elbow		
Humerus		
Shoulder		
Clavicle		
Scapula		
Lower Extremity: Toes		
Foot		
Ankle		
Leg		
Knee		
Femur		
Hip		
Pelvis		
Vertebral Column: Cervical Spine		
Thoracic Spine		
Lumbar Spine		
Sacrum		
Coccyx		
Sacroiliac Joints		
Thoracic Cavity: Chest		
Ribs		
Sternum		
Chest fluoroscopy		
Cardiac Series		
Abdominal Cavity: Supine Abdomen		
Erect Abdomen, Decub.		

EXAMINATION	NUMBER OF EXAMS	
	Aided	Not Aided
Urology:		
IVP		
Retrograde Pyelogram		
Voiding Cystourethrography		
Infusion IVP		
Digestive:		
Barium Swallow		
Upper GI		
Small Bowel		
Barium Enema		
Air-Contrast Colon		
Gall Bladder		
IVC		
T-Tube Cholangiogram		
Skull:		
Routine Skull		
Mastoids		
IAC		
Mandible		
Facial Bones		
Nasal Bones		
Sinuses		
Zygomatic Arches		
TMJ		
Salivary Glands		
Orbits, Optic Foramen		
Sweets Eye		
Operating Room:		
Orthopedic (Specify exam)		
General Surgery		
Neuro		
Pacemaker Insertion		
C-Arm Hip Pinning		
Portables: (Specify exam)		
Orthopedic		
Chest		
Other		
Specials and Miscellaneous:		
Pelvimetry		
Bronchogram		
Hystersalingogram		
Tomogram		
Scan-o-gram		
Bone age		
Metastatic or Metabolic Series		

EXAMINATION	NUMBER OF EXAMS	
	Aided	Not Aided
Mammography		
Arthrography		
ERCP		
Neuro: Myelogram		
Discogram		
Pneumoencephalogram		
Arteriogram		
Vascular: Venogram		
Abdominal Angiogram		
Angiocardiogram		
Lymphangiogram		
Dark Room: Total Hours		
Radiologist Rotation: Total Hours		
Nuclear Medicine: Total Hours		
Radiation Therapy: Total Hours		
Ultrasound: Total Hours		
Computed Tomography: Total Hours		
Others:		

EVALUATION RECORD FORM

Routine Radiographs 90%

(44 exams = 90%)

Name____________________

EXAMINATION	GRADE	DATE	REPEAT	COMMENTS
Abdomen Eract, Decub.				
Ankle				
Calcaneous				
Chest (PA & LAT)				
Chest (Special proj.)				
Elbow				
Extremity (lowerwith cast)				
Extremity (upper, cast)				
Femur				
Foot				
Foot (toes)				
Forarm				
Hand				
Hand (fingers)				
Humerus				
Knee				
Knee (patella, tunnel)				
KUB				
Lower Leg				
Pediatric Chest				
Portable (general)				
Wrist				
Cervical Spine				
Cervical Spine (Obl.)				
Cholecystography (oral)				
Clavicle				
Colon				
Colon (air contrast)				
Esophagus study				
Hip				
Hip (cross table lat)				
I.V.P.				
Lumbar Spine				
Lumbar Spine (Obl.)				
Pelvis				
Ribs (lower)				
Ribs (upper)				
S.I. joints				
Scapula				
Shoulder				
Small Bowel study				
Sternum				
Thoracic Spine				
Thoracic Spine (swimmers)				
Upper G.I.				
Cranium				
Facial Bones				
Mandible				
Mastoids				

EXAMINATION	GRADE	DATE	REPEAT	COMMENTS
Nasal Bones				
Orbit or optic foramen				
Sinus				
Other				

SPECIAL PROCEDURE RADIOGRAPHS (60%)

EXAMINATION	GRADE	DATE	REPEAT	COMMENTS
Hip Pinning				
Open Reduction Surgery				
Operative Cholangiogram				
Tomography				
Arteriography				
Arthrography				
Cystography				
Retrograde Pyelography				
Mammography				
Myelography				
Pacemaker Insertion				
Pelvimetry				
Salpingography				
Voiding Cystourethrogram				
Other				

PARTICIPATION IN OTHER AREAS

AREA	HOURS	DATES--START AND FINISH
Computerized Tomography		
Darkroom Work		
Nuclear Medicine		
Office Work		
Radiation Therapy		
Ultrasound		
Xeroradiography		
Other		

RECORD OF DEMONSTRATED JOB COMPETENCIES

STUDENT NAME ______________________ PROGRAM ______________________

DICTIONARY OF OCCUPATIONAL TITLES JOB CLASSIFICATION: D.O.T. No. ______________________

JOB TITLE ______________________

Unit No.	Competency Demonstrated	Initial Date
	Introduction to Radiologic Technology	
1.01	Describing the history of radiology and	
1.02	Describing program guidelines and organization	
1.02	Demonstrating a professional attitude	
	Maintaining Records	
2.01	Indexing and filing radiographs	
2.02	Filing records such as correspondence, etc.	
2.03	Forwarding radiographic reports to physicians	
2.04	Processing loans of radiographs	
2.05	Maintaining radiology work record	
2.06	Preparing supply requisitions	
2.07	Preparing charges and credits for patient billing	
2.08	Preparing safety and accident reports	
2.09	Checking for signed permit forms	
2.10	Interviewing and recording patient's medical history	
	Radiation Protection	
3.01	Issuing and collecting radiation detectors such as film badges	
3.02	Providing radiation protection for self, co-workers and patients (Introduction)	
3.03	Evaluating radiation monitoring reports	
	Patient Care	
4.01	Washing hands	
4.02	Caring for a patient receiving an IV infusion	
4.03	Transporting patient in a wheelchair	
4.04	Transporting a patient on a stretcher	
4.05	Turning a patient in bed	
4.06	Taking blood pressure	
4.07	Taking pulse and respiration	
	Emergency Procedures	
5.01	Administering oxygen	
5.02	Providing first aid for a shock victim	
5.03	Providing first aid for a convulsing patient	
5.04	Providing assistance for a vomiting patient	
5.05	Providing first aid for a patient who has fainted	
5.06	Administering CPR	
5.07	Controlling external hemorrhage	
5.08	Maintain emergency tray	
	Preparation of Patient	
6.01	Preparing patient for Radiographic Examination	
6.02	Handling patient with a skull or spine injury	
6.03	Handling patient with a fractured hip or extremities	
6.04	Restraining pediatric patients for radiographic examination	
6.05	Administering contrast media rectally (or through stoma)	
6.06	Administering contrast media orally	
6.07	Preparing contrast media for intravenous injection	
	Sterile/Isolation Procedures	
7.01	Putting on and removing sterile gloves	
7.02	Putting on and removing sterile gown	
7.03	Putting on and removing mask	
7.04	Setting up sterile field	
7.05	Scrubbing patient's skin	
7.06	Making radiographs in the isolation unit	
	Routine Radiographic Procedures	
8.01	Positioning the patient in basic positions	
8.02	Making radiographs of the chest	
8.03	Making radiographs of the abdomen	
8.04	Making radiographs of the upper extremity and shoulder girdle	
8.05	Making radiographs of the lower extremity	
8.06	Making radiographs of the pelvis and hips	
8.07	Making radiographs of the vertebral column	
8.08	Making radiographs of the body throax and soft tissue of the chest	

Unit No.	Competency Demonstrated	Initial Date
8.09	Making radiographs of the cranial bones	
8.10	Making radiographs of the facial bones	
8.11	Making radiographs of the mandible, sinuses and temporal bones	
8.12	Making radiographs using mobile X-ray units	
8.13	Making radiographs in the operating room	
8.14	Assisting with contrast radiographs and fluorographic studies	
8.15	Making voiding cystourethrograms	
8.16	Making intravenous pyelograms	
8.17	Making intravenous cholangiograms	
	Special Radiographic Procedures	
9.01	Loading automatic injectors	
9.02	Assisting with arteriography	
9.03	Assisting with venography	
9.04	Assisting with myelography	
9.05	Assisting with lymphangiograms	
9.06	Assisting with hysterosalpinograms	
9.07	Making pelvimetry radiographs	
9.08	Making tomograms	
9.09	Making steroscopic radiographs	
9.10	Making macroradiographs	
9.11	Making radiographs for long bone measurements	
9.12	Assisting with sialograms	
9.13	Assisting with arthrograms	
9.14	Assisting with bronchograms	
9.15	Assisting with fistula or sinus tract radiographs	
9.16	Make special views of the skeletal system	
	Processing	
10.01	Loading film holders	
10.02	Loading and unloading automatic film changers	
10.03	Processing exposed film in automatic processor	
10.04	Evaluating radiographs for processing artifacts	
10.05	Cleaning film processing equipment	
10.06	Making quality control checks for film processor	
10.07	Testing safelight performance	
10.08	Numbering cassettes and screens for identification	
10.09	Cleaning intensifying screens	
10.10	Testing cassettes for screen contact	
10.11	Describing silver reclamation	
	Imaging	
11.01	Setting up fluoroscopic equipment	
11.02	Loading and unloading photospot camera	
11.03	Setting up video recording equipment	
11.04	Making sonograms	
11.05	Making xeroradiographs	
11.06	Making thermograms	
11.07	Exposing and developing poloroid film packet	
11.08	Making computed tomography scans	

This is to certify that the above named student has demonstrated proficiency in the performance of the tasks and/or competencies indicated above. These tasks and/or competencies have been determined to be the skills and knowledge that are necessary for entry-level employment into the job classification indicated.

Date____________________________

Instructor____________________________

School____________________________

SECTION VIII

SPECIAL NEEDS STUDENT

WORKING WITH SPECIAL NEEDS STUDENTS

Introduction

Special needs students are those who are designated as handicapped and/or disadvantaged. The 1976 vocational education amendment defines handicapped individuals as:

> Persons who are mentally retarded, hard of hearing, deaf, speech impaired, visually handicapped, seriously emotionally disturbed, orthopedically impaired, health impaired, or persons with other specific disabilities, who by reason thereof require special education and related services and who cannot succeed in the regular vocational education programs.

In Title II of the 1976 education amendments disadvantaged persons are defined as:

> Persons (other than handicapped persons) who have academic or economic disadvantages and who require special services, assistance or programs in order to enable them to succeed in vocational education programs.

Federal legislation requires that these special people be given an opportunity to function in a regular classroom. This section provides information on how special needs students are identified and how they can be mainstreamed into regular educational environments.

Figure One presents a model depicting various activities of the process in identifying and mainstreaming special needs students. These activities are conducted at three levels: the system level, the school level and the classroom level. All three levels must work together if implementation of the process is to be effective.

Identification Of The Special Needs Student

Through a variety of pre-testing procedures, special needs students are identified and their potentials are evaluated at the

SPECIAL NEEDS MAINSTREAMING MODEL

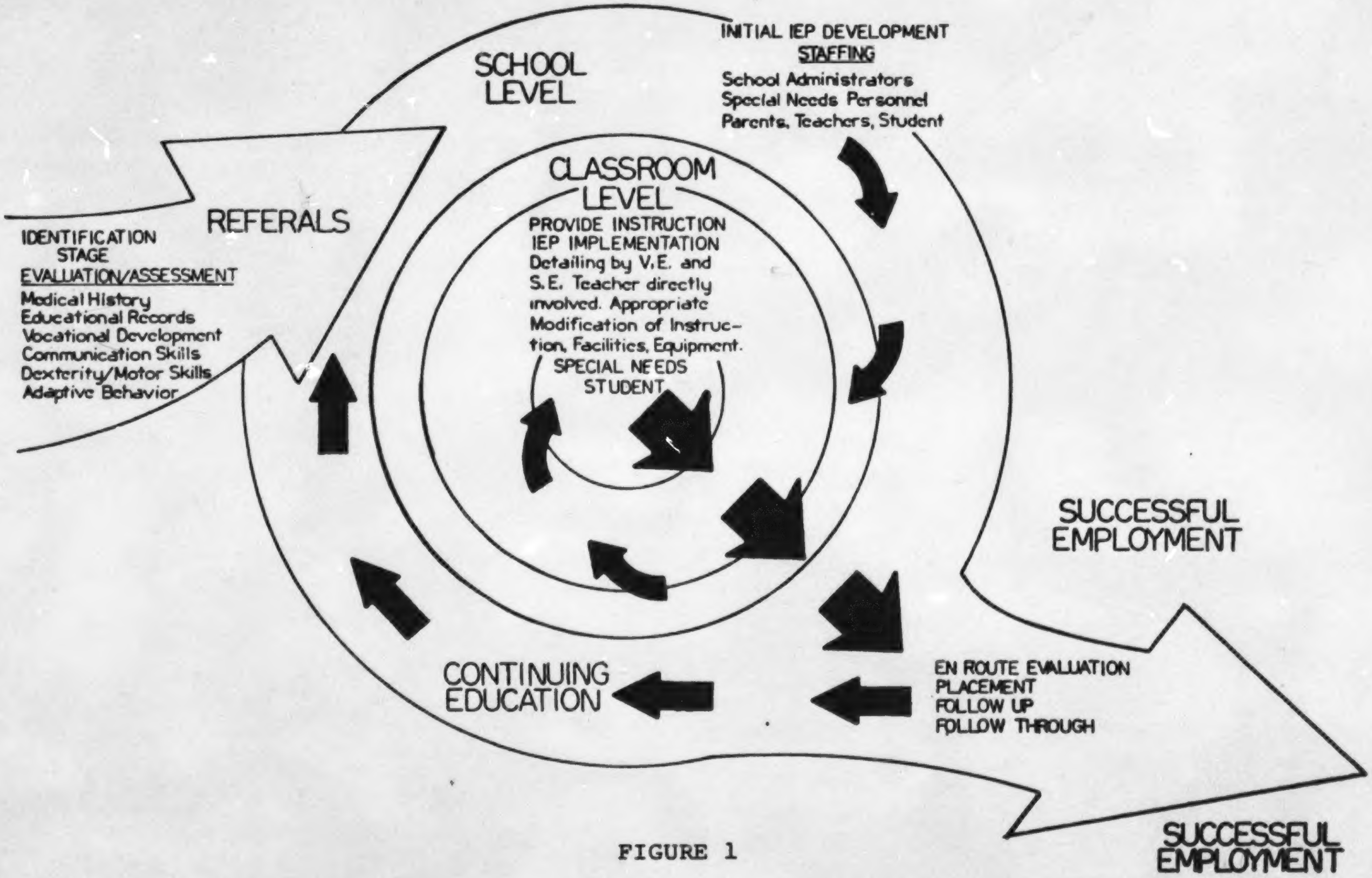

SCHOOL LEVEL
INITIAL IEP DEVELOPMENT
STAFFING
School Administrators
Special Needs Personnel
Parents, Teachers, Student
REFERALS
IDENTIFICATION STAGE
EVALUATION/ASSESSMENT
Medical History
Educational Records
Vocational Development
Communication Skills
Dexterity/Motor Skills
Adaptive Behavior
CLASSROOM LEVEL
PROVIDE INSTRUCTION
IEP IMPLEMENTATION
Detailing by V.E. and S.E. Teacher directly involved. Appropriate Modification of Instruction, Facilities, Equipment.
SPECIAL NEEDS STUDENT
SUCCESSFUL EMPLOYMENT
EN ROUTE EVALUATION
PLACEMENT
FOLLOW UP
FOLLOW THROUGH
CONTINUING EDUCATION
SUCCESSFUL EMPLOYMENT

FIGURE 1

system level. This evaluation process consists of collecting and assessing the following data for each student:

- -Medical History
- -Educational Records
- -Vocational Development
- -Communication Skills
- -Dexterity/Motor Skills
- -Adaptive Behavior

When this procedure has been completed, the system personnel refers the student to the appropriate school level personnel.

Development of the Plan

At the school level, an Individual Education Plan (IEP) is developed for each special needs student. An IEP is a written plan which describes the educational objectives, both long and short term, and the support services for a special needs student. The plan is developed by the school administration, special education personnel, teacher(s) directly involved with the student and the parent(s). In some cases, the student may help with the development.

Implementing the I.E.P.

The actual implementing of the I.E.P. begins at the classroom level. The purpose of the teacher dealing with the special needs student is to help the student set realistic goals, identify the barriers which make it difficult for the student to learn and adapt the curriculum and/or facilities with reference to the I.E.P. so the student can learn while overcoming personal barriers.

Special needs students have problems which hinder their learning. Therefore, a teacher's job becomes more complicated than when teaching "regular" students. Handicapped students may have a variety of problems - mental, physical and/or emotional.

Academically disadvantaged students may exhibit language deficiencies, reading and writing deficiencies, computational deficiencies and general educational deficiencies. Economically disadvantaged students may possess an inability to concentrate because their primary needs - food, shelter, clothing - are not adequately met due to lack of money.

By considering these problems, teachers can modify existing programs to accommodate the needs of special needs learners. Some suggestions which may prove beneficial in modifying an existing curriculum are listed below:

- Prepare instructional materials in greater detail and assign work in shorter units.
- Provide more frequent evaluation of student's progress and provide opportunities for remedial work.
- Be aware of the student's limited vocabulary.
- Be aware of the student's inability to understand abstractions and generalizations and prepare materials accordingly.
- Keep the student aware of his or her progress and make the student feel he or she can succeed.
- Use real teaching aids, live work and practical experiences whenever possible.
- Choose reading material which is at the student's level, interest and experience.
- Use constructive criticism only.
- Use peer instruction whenever possible.
- Allow the student to advance at his or her own pace.
- Use the part-to-whole learning concept in adapting materials.

Materials Which Can Be Used to Teach Disadvantaged

In Georgia an effective set of materials has been developed to be used with a program to help disadvantaged students adjust to life and work situations. This program is called CVAE or Coordinated Vocational Academic Education. The CVAE program is organized with a coordinator who is responsible for the type of instruction the students receive, and a team of teachers assigned to the coordinator who work cooperatively to help the disadvantaged students learn to enjoy school and become more successful students. CVAE materials include visuals in the form of synchronized slide/ tape presentations. These units are designed to help the disadvantaged student become more successful in school, learn good work habits, become an aware consumer, and develop a better self-image and appearance. (Although designed especially for disadvantaged students, CVAE may also be used in regular classroom situations). The vocational education teacher should work with the CVAE coordinator to design a program of study for the disadvantaged students in areas in which the student needs help.

In some cases, facilities, must be modified for handicapped special needs students. In general, as long as the classroom/ shop meets federal guidelines for barrier free design, extensive facility changes need not be made. For visually impaired students, for example, let the student locate in the classroom where he or she can see best even to the point of moving the desk or work station as a portable unit. In the case of orthopedically handicapped, some changes may have to be made to shop machinery to allow the student to use it. This may involve more convenient controls or special seating where the student would normally stand. In making these changes, special education expertise would be helpful.

Evaluation

Evaluation of the student's program should consist of:

- En-route evaluation (formative) to monitor the student's progress through the program.

- Summative evaluation upon completion of the program to determine job readiness.

- Follow-up after placement to determine if the student is successful on the job.

- Follow-through activities designed to identify any further training needed, which is indicated by the follow-up procedure.

Working with special needs students is much more demanding of the system, the school and the classroom teacher. However, with their patience and understanding, special needs students can not only succeed, but in many cases excell.

RESOURCES

To aid the teacher in modifying materials for special needs categories, the following references are listed by category. These are suggested references only as a world of materials exist on this subject.

Mentally Retarded

A Curriculum Guide for Teachers of Educable Mentally Retarded. Danville, Ill.: The Interstate Printers and Publishing Co., Inc.

High, Elizabeth C., and Moyers, Kathy L. Training Manual: Developing Pre-Vocational/Vocational Skills in Developmentally Disabled Persons. Washington, D.C.: Job Development Laboratory, George Washington University, 1976.

Kolstoe, Oliver P. Teaching Educable Mentally Retarded Children. Holt, Rinehart and Winston, 1976.

Mulligan, Robert E.; Gavin, Donald and Conaley, James. Comprehensive Career Education Curriculum Guide for the Trainable. New Brunswick, N.J.: Rutgers Vocational-Technical Curriculum Laboratory, 1977.

Introduction to Vocations for Educable Mentally Retarded. New Jersey: New Jersey Department of Education.

State of Ohio Curriculum Guide for Moderately Retarded Learners. Columbus, Ohio: Ohio Department of Education, 1977.

Tucker, Mark M. Learning through Curriculum Modification; A Blueprint to Teaching the Mentally Retarded. Johnstown, PA.: Mafex Associates, Inc., 1976.

Watson, Marjorie. Mainstreaming the Educable Mentally Retarded. Washington, D.C., NEA, 1975.

Hearing Impaired

Alvin, Howard P. The Evolution of an Evaluation Design for Evaluating Secondary Programs for the Deaf in Vocational Occupational-Technical Education (VOTE) Programs. ERIC -- ED 123-241.

Guidelines: Educational Planning for the Hearing Handicapped. North Carolina Public Schools. Division for Exceptional Children, North Carolina Department of Public Instruction, Raleigh, N.C., 1977.

Munson, Harold L.; Eglston, Judy Cobb and Phillips, Gordon B. Career Education for Deaf Students: An Inservice Leader's Guide. University of Rochester, College of Education, Center for the Study of Helping Services, Rochester, N.Y. 1975.

Nix, Gary W. Mainstreaming Education for Hearing Impaired Children and Youth. Grune and Stratton, 1976.

Orthopedically and Other Health

A Model Plan for a Cooperative Vocational Rehabilitation Program. Office of Human Development, Rehabilitation Services and Administration. Department of Health, Education and Welfare, Washington, D.C.

Mallix, Kalisanker and Mueller, Jim. Vocational Aids and Enhanced Productivity of the Severely Disabled. The George Washington University Rehabilitation Research and Training Center, Washington, D.C. 1975.

McCarthy, Henry and Smart, Landon. Recommendations for Enhancing Employment Prospects of Handicapped Individuals. Comps. Human Resources Center, Albertson, L. I., 1978.

Duncan, John, et al. Environmental Modifications for the Visually Impaired: A Handbook. Visual Impairment and Blindness, December 1977, p. 442-455.

Disadvantaged

Guidelines for Methods and Techniques of Teaching Disadvantaged Students. Division of Vocational Education, Virginia Polytechnic Institute and State University, Blackburg, VA.

A Handbook for Developing Programs and Services for Disadvantaged Students. Department of Vocational Education Studies, College of Education, Southern Illinois, University of Carbondale, Carbondale, Ill. 62901

By Program

Adaption of Home Economics Curricula for Special Needs. North Dakota Research Coordination Unit, State Board for Vocational Education, State Office Building, Bismarck, ND.

Auto Body: An Adaptive and Developmental Program for Special Needs Students. Vocational-Technical Curriculum Laboratory, Rutgers - The State University, New Brunswick, N.J. 1976.

Floriculture Board of Cooperative Educational Services of Nassaw County, Division of Occupational Education, Division of Special Education, Westburg, NY 1975.

Grubb, Francine. *Basic Business* - A Teacher's Guide to an Employment Orientation Course for Special Needs Students. Vocational Technical Curriculum Laboratory, Rutgers - The State University, New Brunswick, N.J. 1976.

Home Economics and the Exceptional Student: A Handbook for Home Economics Teachers Working with Mentally Retarded Students. Vocational-Technical Curriculum Laboratory, Rutgers - The State University, New Brunswick, N.J. 1976.

Troutman, Carol M. *Introduction to Office Occupations*. Vocational-Technical Curriculum Laboratory, Rutgers - The State University, New Brunswick, N.J. 1974.

Working with the Handicapped in the Vocational Home Economics Classroom. Division of Vocational Education, State of Ohio, Columbus, Ohio.

Coordinated Vocational Education and Training (C.V.E.T.) manuals for disadvantaged, available from: Oklahoma State Department of Vocational and Technical Education, Curriculum and Instructional Materials Center, 1515 West Sixth Avenue, Stillwater, Oklahoma 74074.

-CVET Construction	3100219	Teacher's Guide
	3100209	Student
-CVET General Mechanics	3100239	Teacher's Guide
	3100229	Student

General Special Needs

A Handbook for Modifying Vocational Curricula for Handicapped Students. Wisconsin Vocational Studies Center, University of Wisconsin, Madison, May 1980.

Bottoms, J.E. and Scott, C.P. Supportive services for special student groups. In J.E. Wall (ed.), *Vocational Education for Special Groups*. Sixth Yearbook, Washington, D.C.: American Vocational Association, 1976.

Gill, Douglas H. and Scott, C. Paul. A practical model for mainstreaming handicapped learners in vocational education. *The Journal for Vocational Special Needs Education*, Vol. 1, No. 3, April, 1979, pp. 3-7.

Gugerty, J., et al. *Tools, Equipment and Machinery Adapted for the Vocational Educator and Employment of the Handicapped*. Project #498749006, Wisconsin Vocational Studies Center, Madison, Wisconsin, January 1981.

Hull, Marc E., Berry, Owen J. and Clark, Donald L. *Procedures for Teaching Vocational Concepts to Students with Special Needs*. Texas A & M University, Final Report Project 62350274, June 1976.

The Related Vocational Instruction Program. Georgia's Approach to Vocational Education for the Handicapped at the Secondary level, Douglas H. Gill, Project Coordinator, Vocational Programs for the Handicapped, Georgia Southern College, Statesboro, Georgia.

Vocational Educational Resource Materials, A Bibliography of Materials for Handicapped and Special Education. Third edition, 1978. Wisconsin Vocational Studies Center, University of Wisconsin - Madison.

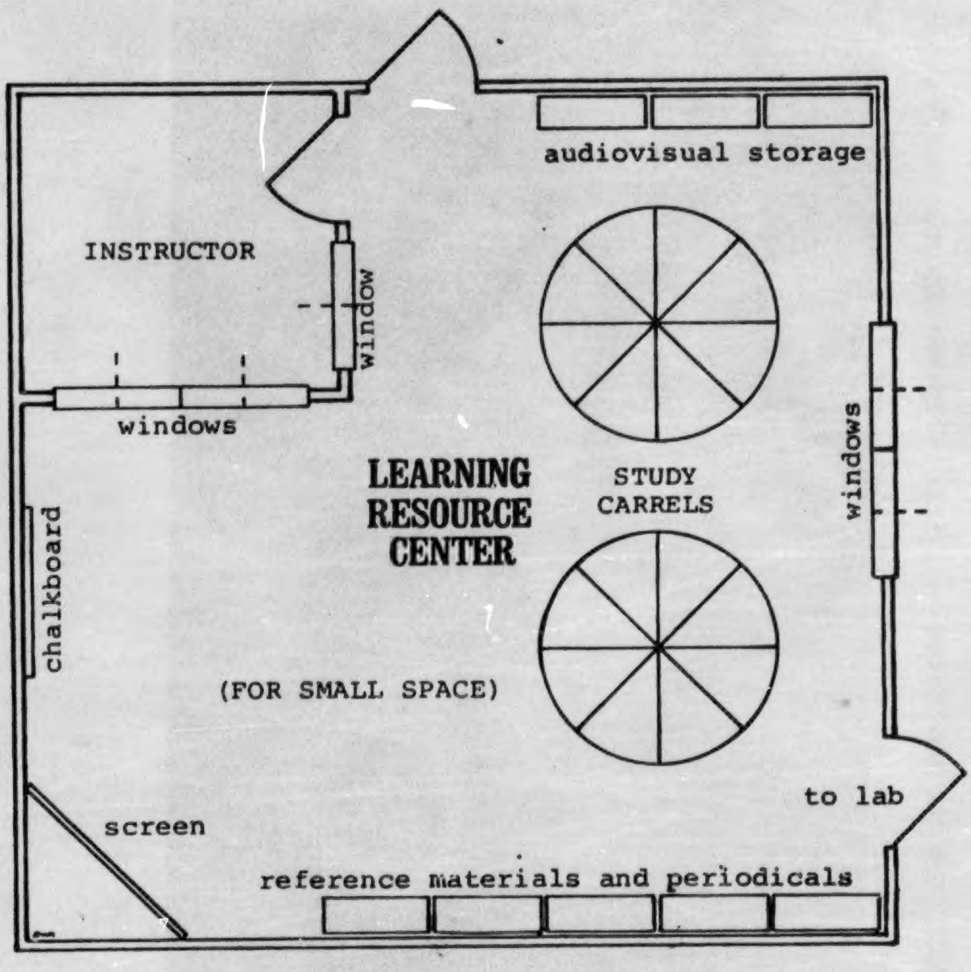
SECTION IX

FACILITY LAYOUT

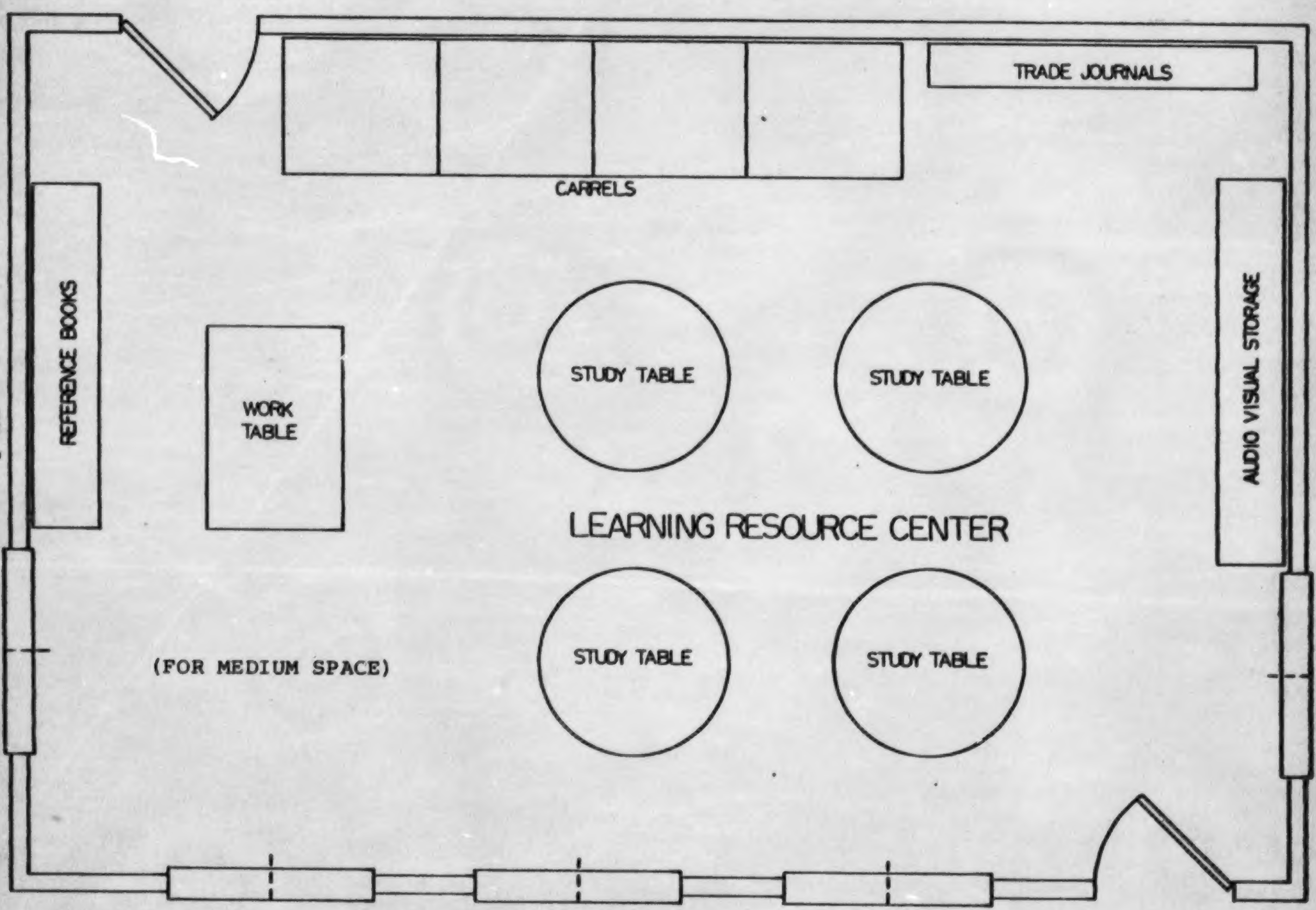
Facility Layout

The facility layouts on the following pages ar presented to aid in arranging the classroom and laboratory for efficient instruction. The three resource center arrangements represent small, medium and large centers. Ultimately the instructor must determine an arrangment that best fits the needs of the students and the instructional method being used.

These layouts may be especially useful in those schools where classroom renovation or construction is being planned.

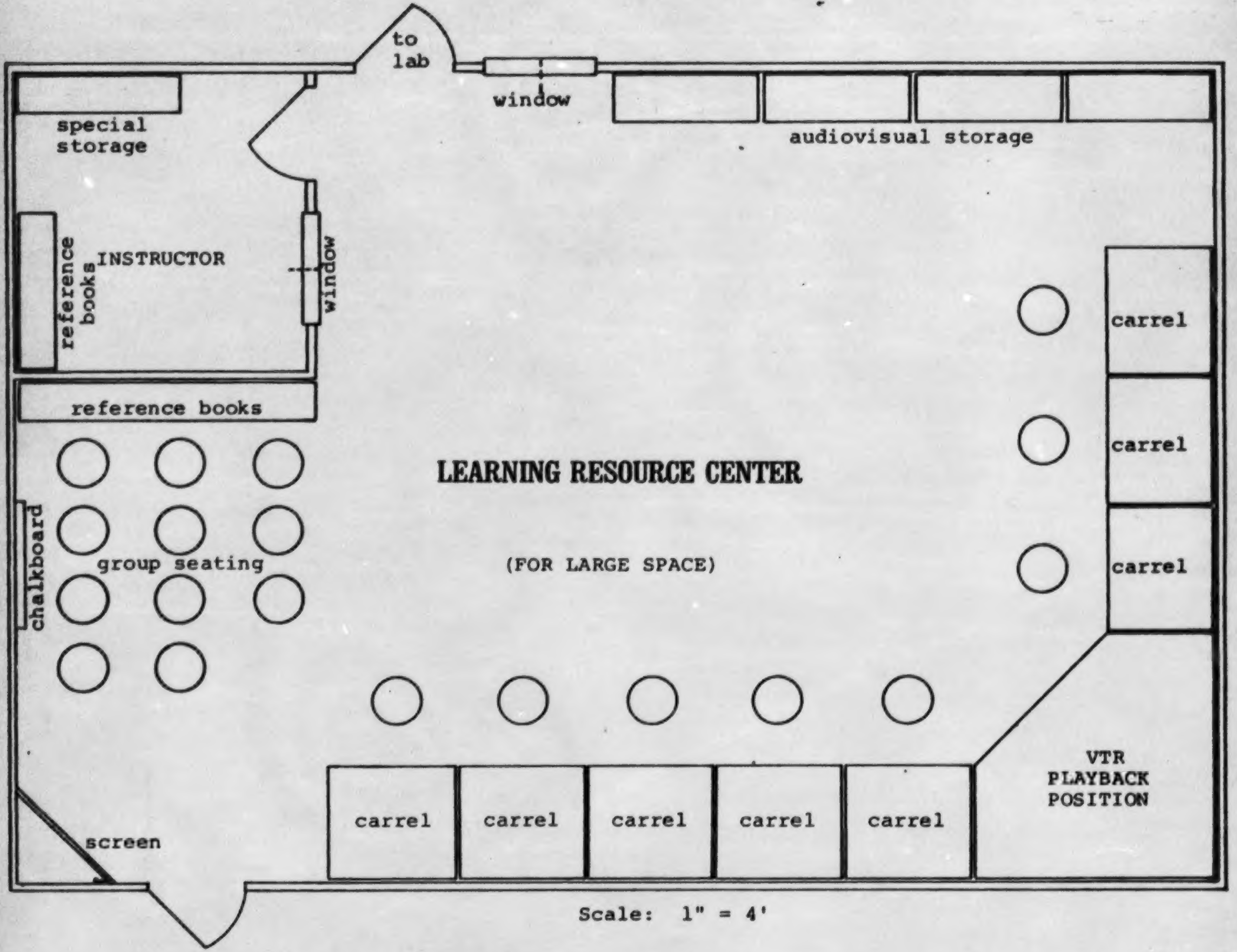

audiovisual storage
INSTRUCTOR
window
windows
LEARNING RESOURCE CENTER
STUDY CARRELS
windows
chalkboard
(FOR SMALL SPACE)
to lab
screen
reference materials and periodicals

Scale: 1" = 4'

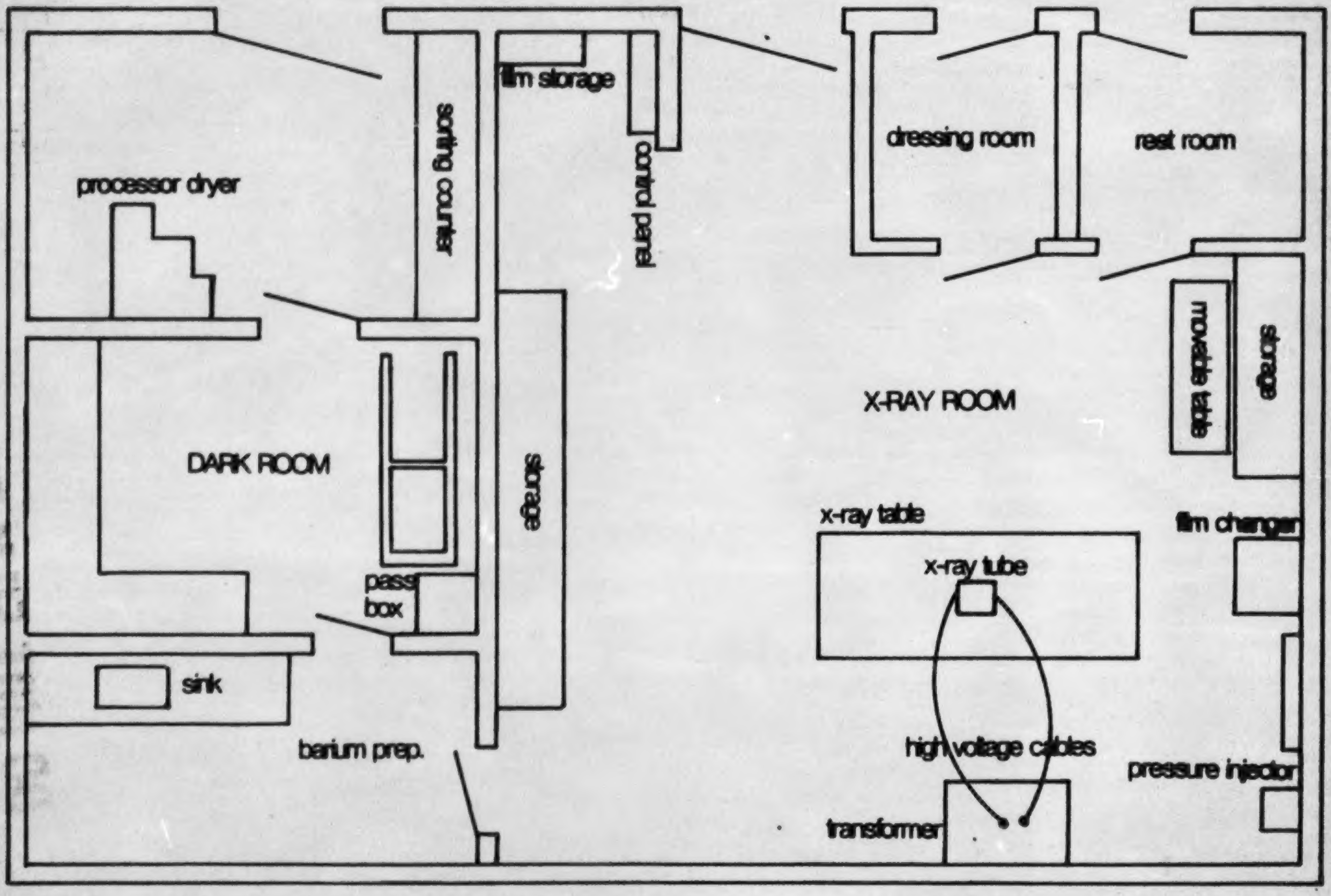

TRADE JOURNALS
CARRELS
REFERENCE BOOKS
WORK TABLE
STUDY TABLE
STUDY TABLE
AUDIO VISUAL STORAGE
LEARNING RESOURCE CENTER
STUDY TABLE
STUDY TABLE

(FOR MEDIUM SPACE)

IX-5

to lab
window
special storage
audiovisual storage
reference books
INSTRUCTOR
window
reference books
chalkboard
group seating
LEARNING RESOURCE CENTER
(FOR LARGE SPACE)
carrel
carrel
carrel
carrel
carrel
carrel
carrel
carrel
VTR PLAYBACK POSITION
screen

Scale: 1" = 4'


film storage
sorting counter
control panel
dressing room
rest room
processor dryer
movable table
storage
X-RAY ROOM
DARK ROOM
storage
x-ray table
film changer
x-ray tube
pass box
sink
barium prep.
high voltage cables
pressure injector
transformer

SECTION X

DEFINITION OF TERMS

DEFINITION OF TERMS

1. AV's-Audiovisuals - May refer to any picture and/or sound media. (ie. slides, tapes, filmstrips, 16 mm films, etc.)

2. Checkpoint - A student-instructor interface point wherein the instructor may give the student a test, perform a demonstration, or simply provide the student with additional needed information or instructions. Also a checkpoint may be used for motivational purposes.

3. Competency - The ability (knowledge, skills and attitudes) to perform all of a group or cluster of related tasks required to complete a designated activity according to occupational standards. In the educational setting the statement of a competency includes expected student outcomes in terms of knowledge, skills, and attitudes required to complete a designated activity as defined by incumbent workers according to the standards of the work place.

4. Course - A grouping of tasks and competencies which have a common knowledge base or are within a given domain.

5. Criterion-Referenced Measure - An exercise based upon a performance objective, the accomplishment of which measures attainment of that objective.

6. Criterion-Referenced Test - A test designed to measure student competencies based on job or industrial standards.

7. Curriculum Guide - A document containing the objectives, content, organization, and structure of an instructional program. It is designed for use by administrators, instructional supervisors and teachers.

8. D.O.T. - Abbreviation for Dictionary of Occupational Titles. Document provides nine digit codes identifying each occupation.

9. Duty - One of the distinct major activities involved in the work performed, comprising related tasks.

10. Exit Point - A predetermined point within an instructional program in which a student may exit with the essential competencies for a specific job. Usually defined in terms of D.O.T. codes and/or O.E. codes.

11. "Hands-On" - Statement implying the student is physically involved in a learning activity.

12. Individualized Instruction (I.I.) - A system of instruction allowing for a student to progress at their fastest rate.

13. Job - A specific area of specialization within an occupational field consisting of several closely related duties for which a person would expect to receive remuneration. Should be identified by DOT code.

14. Job Sheet - (Or Operations Sheet) - A project of a performance nature. Generally performed by the student in a lab or shop type environment or in a specialized work area.

15. Live Work - Generally refers to items brought into the course area for repair or adjustment. Examples of live work might be automobiles, radios and TV's, air-conditioners, etc. Another form of live work would be patrons visiting the cosmetology department to receive permanents or other services.

16. Master Copies - Original copies of slides, tapes or written materials set aside for the purpose of duplication.

17. Occupational Cluster - A group of occupations sharing a common core of competencies. Georgia's comprehensive high school vocational program is organized around this concept.

18. Occupational Inventory - A listing of tasks to be performed in a particular occupational area, grouped under duty classifications.

19. O.E. - Refers to the U. S. Office of Education. O.E. codes are a classification system (taxonomy) for occupational education programs.

20. Open Entry - Term meaning that a student may enter the program at any time and does not have to wait for quarter or semester breaks.

21. Open Exit - Term meaning that a student may leave a program any time he/she completes their occupational objective.

22. Performance Guide - A series of steps, arranged in a sequence ordinarily followed, which when completed may result in the performance of a task. Also called "teaching steps."

23. Performance Objective - A statement in precise, measurable terms of a particular behavior to be exhibited by a learner under specified conditions. It possesses each of the elements or characteristics specified below:

    a. Condition - The testing situation confronting the learner is clearly specified. This includes equipment provided or withheld, environmental constraints such as temperature, space, etc.

b. Performance - The specific behavior expected of the learner is stated.

c. Standard - The degree of acceptable performance is specified.

24. Performance Test - A test entailing not only the ability to answer questions, but measuring the students' ability to operate, manipulate, or perform a given task as well.

25. Program - An organized sequence of courses leading to an occupational objective. A program may contain one or more student exit points as defined by D.O.T. codes.

26. Program Objective - The outcome of a prescribed program of instruction. Usually expressed in terms of the occupation or job for which training is designed. D.O.T. codes are frequently used to identify program objectives or student exit points.

27. Self-Paced - Refers to a student moving through the prescribed training program at the fastest pace at which the student can meaningfully learn.

28. Sequencing - Putting any set or series of learning activities or tasks into proper order or sequence. Normally arranged from the simple to complex within groupings or blocks.

29. Software - Written or printed materials, slides, filmstrips, tapes, etc.

30. Student Manual - A document designed for use by students in a specific instructional program. It contains unit sheets, references, operational procedures or job sheets, etc.

31. Task - The smallest division of work in which a measurable output occurs. A logical and necessary step in the performance of a duty.

32. Task List - A listing of tasks performed by incumbent workers within a domain of interest. An example is a listing of all tasks performed by an automotive mechanic or by a worker in ornamental horticulture.

33. Unit - One "module" training materials; generally covering one learning task and programmed on one Unit Sheet. May cover more than one lesson.

34. Unit Guide - A curriculum guide sheet that lists a task and objective with the instructional activities, instructional materials, evaluation and approximate time required for a student to successfully complete the task.

35. V-TECS Catalog - A comprehensive collection of performance objectives, performance guides, criterion-referenced measures, and related data, organized by a job structure or career ladder within a domain of interest.

Federal law prohibits discrimination on the basis of race, color or national origin (Title VI of the Civil Rights Act of 1964); sex (Title IX of the Educational Amendments of 1972 and Title II of the Vocational Education Amendments of 1976); or handicap (Section 504 of the Rehabilitation Act of 1973) in educational programs or activities receiving federal financial assistance.

Employees, students and the general public are hereby notified that the Georgia Department of Education does not discriminate in any educational programs or activities or in employment policies.

The following individuals have been designated as the employees responsible for coordinating the department's effort to implement this nondiscriminatory policy.

Title II - Loydia Webber, Vocational Equity Coordinator
Title VI - Peyton Williams Jr., Associate Superintendent
of State Schools and Special Services
Title IX - Evelyn Rowe and Myra Tolbert, Coordinators
Section 504 - Jane Lee, Coordinator of Special Education

Inquiries concerning the application of Title II, Title VI, Title IX or Section 504 to the policies and practices of the department may be addressed to the persons listed above at the Georgia Department of Education, State Office Building, Atlanta 30334; to the Regional Office for Civil Rights, Atlanta 30323; or to the Director, Office for Civil Rights, Education Department, Washington, D.C. 20201.